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Frosty Bay Timber Sale Final Environmental Impact Statement

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Location Map, Frosty Study Area



Frosty Study Area



LEGEND

- ~ SHORELINE
- ~ STREAMS
- ~ STUDY BOUNDARY
- LAKES

MILES

MAPSCALE 163360

MAP PREPARED 07/09/90

By tjeffries

Final Environmental Impact Statement

Frosty Bay Timber Sale

U.S.D.A. - Forest Service
Tongass National Forest
Stikine Area
August 1990

Responsible Agency: U.S.D.A. Forest Service
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Received:* Within 45 days of the date of publication of
the Final EIS in the Petersburg Pilot. Appeals
must be addressed in writing to Michael A.
Barton, Regional Forester, Federal Office
Building, Box 21628, Juneau, AK 99802-1628.

Abstract: This Final Environmental Impact Statement describes the impact of four alternative approaches to harvesting timber in the Frosty Bay Study Area, in addition to a no-action alternative. Special considerations include the use of Frosty Bay as an anchorage and the presense of high concentrations of Vancouver Canada Geese.

Key Words: Frosty Bay, helicopter logging, independent sale, Vancouver Canada goose, anchorage.

Introduction

The Draft Environmental Impact Statement (EIS) for the Frosty Timber Sale was published in December 1989. As a result of public comments and internal review, a number of changes have been made. The addition of new material has been highlighted with asterisks. For example, asterisks mark the beginning and end of this paragraph.

Independent timber sales are allowed by the Tongass Land Management Plan (the Forest Plan) in order to maintain a supply of timber for forest industries in southeast Alaska. The Cleveland timber sale was first proposed on the Cleveland Peninsula, on the Wrangell Ranger District, in 1983. The area is identified in the Forest Plan as land-use designation (LUD) IV, *for intensive resource use and development where emphasis is primarily on commodity or market resources.* Two environmental assessments were prepared and two decision notices signed in 1984, one for a timber sale and one for a log transfer facility. The sale was deferred, however, due to poor market conditions. It became more attractive when market conditions improved.

In 1987 a new analysis was begun and a sale planned for offer in 1990. The environmental assessment and decision notice for the log transfer facility were considered adequate, but Forest Service managers decided to document the sale with an environmental impact statement and rename the sale "Frosty."

Resource inventories developed previously were supplemented with additional information. Although Alternative D was selected in the Cleveland environmental analysis, it was no longer considered acceptable. Four new alternatives were considered in the Draft EIS, along with the option to select additional helicopter units.

Alternative 3a was developed in response to public comments on the Draft EIS, and in response to additional field verification. Although it is based on the preferred Alternative 3 in the Draft EIS, the changes were significant enough to warrant a new alternative. All the changes based on public comment and field verification have been incorporated into this alternative to synthesize a better preferred alternative. The other action alternatives were left as presented in the Draft EIS for comparison purposes.

Alternatives Considered

Alternative 1

No action. Existing conditions maintained. Area would remain undeveloped and timber harvest would be deferred.

Alternative 2

Approximately 40 million board feet of timber would be harvested on 2013 acres and 14.0 miles of specified road¹ would be constructed. This includes 12 million board feet and 574 acres in helicopter units.

¹ The location and construction standards of these roads are specified by the Forest Service. Specified roads are sometimes referred to as permanent or system roads.

Summary

- Alternative 3** Approximately 34 million board feet of timber would be harvested on 1707 acres and 14.0 miles of specified road¹ would be constructed. This includes 12 million board feet and 574 acres in helicopter units.
- *Alternative 3a*** *Approximately 26 million board feet of timber would be harvested on 1273 acres and 12.2 miles of specified road¹ would be constructed. This includes 5 million board feet and 260 acres in helicopter units.*
- Alternative 4** Approximately 29 million board feet of timber would be harvested on 1436 acres and 11.6 miles of specified¹ road would be constructed. This includes 12 million board feet and 574 acres in helicopter units.
- Helicopter Option** *The Draft EIS provided* the option to add additional helicopter harvest units to any of the action alternatives. Up to 12 million board feet of timber could be harvested on 574 acres. This volume was considered uneconomical in the Cleveland analysis, but became more attractive with improved market conditions.
- *In the Draft EIS, helicopter harvest units were listed separately from each alternative and packaged as a "helicopter option" that could be added to any action alternative. In this Final EIS the helicopter option is incorporated into each alternative in order to better assess the cumulative impacts of helicopter and high-lead logging together. Helicopter units are shown with associated alternatives in Figures 2-1 through 2-4.*
- *Field verification indicated that only 260 acres of the 574 acre helicopter option were feasible to harvest at this time. The remaining 314 acres were not included because they are located on steep slopes. The 260 feasible acres are incorporated into Alternative 3a. All 574 acres were incorporated into Alternatives 2, 3, and 4 to remain consistent with the Draft EIS. While one might argue that the helicopter acreage should be reduced in all action alternatives, the IDT suggests that time was better spent focussing effort on preparation of a better preferred alternative, Alternative 3a.*

Consequences

Each alternative provides a different mix of resource outputs that emphasize different resource values.

Vancouver Canada Goose

The most unique resource value within the Frosty area is the presence of breeding and rearing areas for the Vancouver Canada goose. Goose habitat is primarily along streams and near ponds, and has been protected with each alternative by leaving trees standing along Class 1 and Class 2 streams. There is no goose habitat on Class 3 streams. Even so, the degree of protection varies. Alternative 1 provides the greatest protection because there would be no development. Of the action alternatives, Alternative 4 provides the greatest protection followed by Alternative 3 and then Alternative 2. *Alternative 3a provides more protection for goose habitat than Alternative 3, and includes a timing restriction on road construction and harvest activities during nesting periods.*

¹ The location and construction standards of these roads are specified by the Forest Service. Specified roads are sometimes referred to as permanent or system roads.

Recreation

Frosty Bay is sometimes used as an anchorage by recreational boaters and commercial fishermen in stormy weather. There is some risk that the size and location of one harvest unit in Alternative 2 would allow wind to blow across the previously protected anchorage.

Inland recreation access would be made easier by the construction of roads. Alternatives 2 and 3 provide the greatest access, Alternative 4 provides some access, while Alternative 1 provides no road access. *Alternative 3a provides access similar to Alternatives 2 and 3.*

The nature of recreational opportunities would change from Primitive and Roadless to Roaded and Modified with selection of an action alternative. Alternatives 2 and 3 would create more change than would Alternative 4, and Alternative 1 would maintain current recreational opportunities. *Alternative 3a would create a change similar to that of Alternatives 2 and 3.*

Visual Resources

In a Forest-wide inventory process, the Visual Quality Objectives (VQOs) for the Frosty area have been established as "Modification" in the areas seen from saltwater travel routes and "Modification" and "Maximum Modification" in the unseen areas. The visual condition in Alternatives 1 and 4 would have less impact than the inventory VQOs allow; the visual condition in Alternative 3 meets inventory visual quality objectives (VQOs); in Alternative 2 the visual condition does not meet the inventory VQOs. *The visual condition in Alternative 3a meets inventory VQOs.*

Mitigation of Consequences

If an action alternative is selected, the following steps are required as part of the sale and layout requirements to mitigate consequences, pending incorporation into the Record of Decision (ROD) by the Stikine Area Forest Supervisor:

- (a) The contractor will be required to *select a camp location that does not affect the long term visual quality of Frosty Bay or Seward Passage. Options include a floating camp and an inland camp. A proposed inland location is near Unit 5 (see Unit Description in Appendix E).*
- (b) If *requested by contractor,* a sortyard could be located for sorting logs prior to placement in water. One possible location is near Unit 5. Any location selected should not have an impact on the view from Frosty Bay.
- (c) The log transfer facility and bridges will be temporary structures.
- (d) The Forest Service administrative facility will be designed for use as a recreational cabin once administration has been completed. Landscape design principles will be used in the design and siting of the administrative cabin.
- (e) Minimum 330-foot buffers will be maintained around eagle nest trees.
- (f) *Goose nesting will be protected with the use of timing restrictions on timber harvest and road construction activities from April 1 to June 15 in units and along roads. These are described in the Unit and Road Descriptions in Appendices E and F, and include Units 9, 10A, 10B, 12B, 13B, and 14A, and Roads 6850 and 54501.*

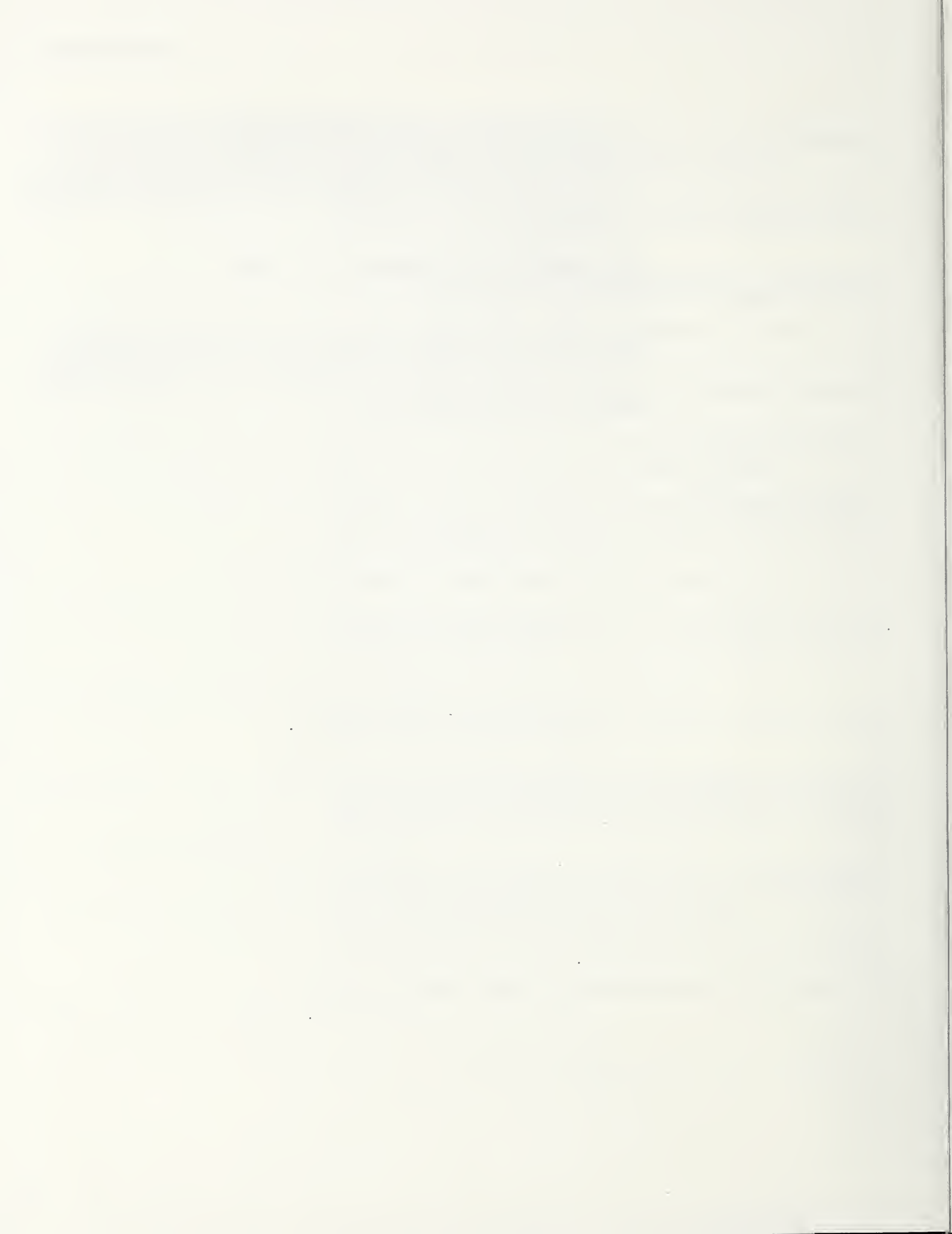
Summary

- (g) *Goat rearing and winter range will be protected with the use of timing restrictions on timber harvest in Unit 22 between December 1 and July 1.*
- (h) *Timber harvest and road building activities will be reported to the Alaska Department of Fish and Game (ADFG) so they can coordinate any hunting restrictions in the Frosty Study Area.*
- (i) *All known or discovered* cultural sites will be protected. If additional sites are discovered once the sale is in operation, protective measures will be taken.
- (j) Aquatic Habitat Management Unit (AHMU) guidelines will be followed for harvest near Class 1, Class 2, and Class 3 streams.
- (k) *The sale area improvement plan should consider the following specific projects in addition to the generally required projects:
 - *Analysis of* construction of a fish pass over the first barrier falls in Frosty Creek, *and pending results of analysis, building a fish pass.*
 - Evaluation of impacts associated with timber harvest activities on breeding Vancouver Canada geese within the sale area, *and if this study indicates a need, a habitat improvement project(s) for geese.*
 - *Evaluation of the effectiveness of AHMU buffer strips.*
 - *Evaluation of impacts of management on the visual resource, and update of Existing Visual Condition maps.*
 - *Trail construction from Unit 14A to the Anan area.*
 - *Moving the administration cabin to a site suitable for a recreation cabin once administrative activities are completed*
- (l) *The visual resource will be protected to the extent required to meet the visual quality objectives for the Frosty area.* Landscape design principles will be used in the design and rehabilitation of the log transfer facility, rock pits, and harvest units.
- (m) *Rehabilitation of Rock Pit Near Log Transfer Facility. Objective: To meet a VQO of Modification in the foreground distance zone (0 - ½ mile) as seen from Frosty Bay by screening the rock pit with vegetation.*
 - 1. *Maintain existing vegetation between road and beach in front of rock pit.*
 - 2. *Store overburden where it will be screened to views from Frosty Bay.*

3. *Return overburden to pit floor and seed. If topography allows, store overburden along western edge of pit, push down over backwall, and spread over pit floor. The intent is to allow soil to catch in ledges of the backwall, quickening revegetation of that wall. If a field check indicates the need for further screening, some overburden may be distributed along the entryway to the pit and planted with alder.*

Alternative Preferred by the Forest Service

The alternative preferred by the Forest Service is Alternative *3a, including 260 acres of the 574-acre helicopter option as described in the Draft EIS. It offers nearly as much timber for industry as Draft Preferred Alternative 3, while providing greater protection for other resources and uses than Alternative 3. Alternative 3a, like Alternative 3, conforms with the Forest Plan.*



Contents

SUMMARY

I. PURPOSE OF AND NEED FOR ACTION

Introduction	1
Purpose of the Project	1
Purpose of the Environmental Impact Statement	1
Decisions to be Made	2
Background	2
Analysis Process	3
Issues	3
Sale Profitability	3
Visual Quality	3
Fish	4
Wildlife Habitat	4
Frosty Bay Anchorage	4
Opportunities	4
Approvals Required From Other Agencies	5

II. ALTERNATIVES

Introduction	7
Process Used to Formulate Alternatives	7
Range of Alternatives	8
Alternatives Considered but Eliminated from Detailed Study	8
Cleveland Preferred Alternative	8
Maximize Timber Harvest	9
Alter Land Use Designations	9
Partial Cutting	9
Identification of the Forest Service Preferred Alternatives	9
Draft EIS	9
Final EIS	9
Mitigation	10
Monitoring	11
Implementation Monitoring	11
Effectiveness Monitoring	11
Alternatives Considered in Detail	12
Alternative 1	12
Common to Alternative 2 through 4	12
Alternative 2	14
Alternative 3	16
Alternative 3a	18
Alternative 4	20
Helicopter Option	22
Summary of Harvest Units	26

III. AFFECTED ENVIRONMENT	
Introduction	29
Watershed	29
Landform and Soils	31
Wetlands and Floodplains	32
Fish	35
Wildlife Habitat Retention	38
Threatened and Endangered Species	39
Humpback Whale	39
Northern (Stellar) Sea Lion	39
Wildlife	39
Sitka Black-tailed Deer	40
Pine Marten	42
Vancouver Canada Goose	42
Black Bear	44
Bald Eagle	44
Mountain Goat	44
Subsistence	45
Subsistence Communities	45
Use of Frosty Area	46
Extent and Type of Use	47
Hunting and Trapping	47
Recreation	47
Wild and Scenic Rivers	48
Wild and Scenic Rivers Act	48
Tongass Forest Plan Revision	48
Frosty Study Area	48
Cultural Resources	48
Visual Resources	49
Minerals	52
Lands	52
Timber	52
Employment	55
Transportation	55
Other Planned or Proposed Activities in Surrounding Areas	56
Power Corridor	56
Deer Island Timber Sale	56
Bradfield River Road	56
Forest Plan Revision	56

IV. ENVIRONMENTAL CONSEQUENCES

Introduction	57
Adverse Environmental Effects Which Cannot Be Avoided	57
Short-Term Use Versus Long-Term Productivity	58
Irreversible Loss of Resources	58
Irretrievable Commitment of Resources	59
Watershed	59
Sensitive Streambanks	59
Proportion of Watershed Harvested	61
Cumulative Effects	61
Landform and Soils	61
Timber Harvest and Soil Hazard Class	61
Road Building	62
Cumulative Effects	62
Wetlands and Floodplains	62
Timber Harvest and Wetlands	63
Roads and Wetlands	63
Floodplains	64
Cumulative Effects	64
Fish	64
Class 1	64
Class 2	64
Class 3	65
Cumulative Effects	66
Wildlife Habitat Retention	66
Threatened and Endangered Species	66
Wildlife	66
Sitka Black-tailed Deer	66
Pine Marten	68
Vancouver Canada Goose	69
Black Bear	69
Bald Eagle	70
Mountain Goat	70
Subsistence	71
Access	71
Abundance and Distribution	71
Changes in Competition from Non-Subsistence Users	72
Cumulative Effects	72
ANILCA Section 810 Finding	72
Hunting and Trapping	72
Recreation	73
Cumulative Effects	74
Wild and Scenic Rivers	74
Cultural Resources	74
Cumulative Effects	75
Visual Resources	75
Alternative 1	76

Alternative 2	76
Alternative 3	76
Alternative 3a	79
Alternative 4	79
Minerals	79
Forest Plan Guidance	80
Timber Economics	81
Employment	83
Cumulative Effects	84
Transportation.	84
Specified Roads	84
Spur Roads	84
Energy Requirements	86
 V. LIST OF PREPARERS	 87
 VI. AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF THE STATEMENT WERE SENT	 89
 VII. GLOSSARY	 91
 VIII. INDEX	 97

Appendices A-J

Maps

Map 1-1	General Location	Inside Front Cover
Map 2-1	Frosty Study Area	Opposite Front Cover
Map 2-2	Alternative 2	15
Map 2-3	Alternative 3	17
Map 2-3a	Alternative 3a	19
Map 2-4	Alternative 4	21
Map 3-1	Watershed Boundaries	30
Map 3-2	Distribution of High Hazard Soils in the Frosty Study Area . .	33
Map 3-3	Distribution of Wetland Types in the Frosty Study Area	34
Map 3-4	Class of Stream Segments in the Frosty Study Area	33
Map 3-5	Barrier Falls in Frosty Creek	37
Map 3-6	Deer Winter Range	41
Map 3-7	Goose and Eagle Habitat	43
Map 3-8	Seen and Non-Seen Area within the Frosty Study Area	50
Map 3-9	Visual Quality Objectives in the Frosty Study Area	51
Map 3-10	Operable Commercial Forest Lands	54
Map 4-1	Location of Sensitive Streambanks	60

Map 4-2	Location of Wildlife Habitat Retention for Alternative 3a	67
Map 4-3	Location of Viewpoint for Visual Appearance of Proposed Harvest	77

Tables and Figures

Table 2-1	Summary of Consequences	23
Table 2-2	High-Lead (Cable) Harvest Units and Acres in Each Alternative	27
Table 2-3	Helicopter Units and Acres	28
Table 3-1	Watersheds in Frosty Study Area	29
Table 3-2	Length of Stream in each Process Group on Frosty Creek . . .	31
Table 3-3	Distribution of Soil Hazard Classes in the Frosty Area	32
Table 3-4	Types of Wetland	32
Table 3-5	Acres of CFL Retained for Various Categories of Wildlife Habitat	32
Table 3-6	Acreage by Volume Class	55
Table 4-1	Length of Sensitive Streambank near Harvest Units	61
Table 4-2	Area Harvested in Each Soil Hazard Class	62
Table 4-3	Miles of Specified Road Proposed in Each Soil Hazard Class .	62
Table 4-4	Timber Harvest on Forested Wetlands	63
Table 4-5	Specified Roads on Wetlands	63
Table 4-6	Miles of Stream Requiring Class 1, Class 2, and Class 3 AHMU Prescriptions	65
Table 4-7	Number of Deer the Frosty Area Could Support in Each Alternative	68
Table 4-8	Number of Pine Marten the Frosty Study Area Could Support in Each Alternative	68
Table 4-9	Proportion of High-Volume CFL Harvested	69
Table 4-10	Black Bear Carrying Capacity	70
Table 4-11	Changes in Type of Recreation Opportunity	73
Table 4-12	Ground Disturbing Activities	74
Table 4-13	Comparison of Volume Classes in Forest Plan Inventory and Frosty EIS Inventory	80
Table 4-14	Comparison of Volume Classes Harvested in Action Alternatives	81
Table 4-15	Timber Values and Costs to an Operator of Average Efficiency	82
Table 4-16	Combined Cable and Helicopter Timber Values and Costs to an Operator of Average Efficiency	83
Table 4-17	Number and Value of Jobs Generated by a Frosty Area Timber Sale	83
Table 4-18	Some Consequences of Transportation System	85
Table 4-19	Estimated Fuel Consumption for Each Alternative on the Frosty Timber Sale	86
Figure 3-1	Proportion of Wetland Types	35
Figure 3-2	Proportion of the Frosty Study Area that is Operable CFL . . .	53
Figure 4-1	Visual Appearance of Harvest Proposed in Each Alternative . .	78

Chapter 1

Purpose and Need

Introduction

The Draft Environmental Impact Statement (EIS) for the Frosty Timber Sale was published in December 1989. As a result of public comments and internal review, a number of changes have been made. The addition of new material has been highlighted with asterisks. For example, asterisks mark the beginning and end of this paragraph.

Purpose of the Project

The purpose of this project is to provide an independent timber sale in the Frosty Creek drainage and three adjacent drainages, collectively called the Frosty study area. The sale is located on the Wrangell Ranger District of the Stikine Area, Tongass National Forest. The proposed sale would help fulfill the government's commitment to the timber industry, as provided in the Forest Plan and the Alaska National Interest Land Conservation Act (ANILCA). The Frosty study area was selected for this short-term timber sale because:

1. It contains an adequate volume of timber on operable, commercial forest land to provide a profitable sale at mid-market prices;
2. It has been specifically identified in the Forest Plan as land use designation IV (LUD IV), for "intensive resource use and development where emphasis is primarily on commodity or market resources;" and
3. It is outside the long-term contract area and has been specifically identified in the Forest Plan for management "oriented to the development of short-term sales for the independent logging community."
4. It is outside of the areas Congress is currently considering for wilderness designation.

The study area is located on the Cleveland Peninsula, adjacent to Seward Passage in Ernest Sound (see map inside front cover). It consists of the Frosty value comparison unit (VCU 524) in the Deer Island Management Area (S-33).

Purpose of the Environmental Impact Statement

This Environmental Impact Statement (EIS) describes alternative approaches to harvesting timber in the Frosty study area. It describes the environment that would be affected by the project, discloses the significant environmental consequences of each alternative, and responds to the issues identified in the public scoping process. Finally, it identifies the alternative preferred by the Forest Service.

Chapter 1

Purpose and Need

Decisions to be Made

The environmental impacts documented in this Environmental Impact Statement provide the basis for the following decisions to be made by the Stikine Area Forest Supervisor and documented in the Record of Decision (ROD):

- a. Will timber harvest and road construction take place in the planning area at this time?
- b. If timber harvest and road construction will take place, how much will occur and where will the units be located?
- c. If timber harvest and road construction are to occur, what special measures, in addition to the normal standards and guidelines, will be needed to protect resource values for fish, wildlife, recreation, and visual quality of the area?

Background

The Tongass Land Management Plan designated various parts of the Forest for different mixes of resource use. The Forest was divided into approximately 850 land areas called value comparison units (VCUs), each consisting of a major watershed or group of minor watersheds. The degree of development and related resource protection intended was indicated by assigning a land use designation (LUD) to each of the VCUs. Designations range from LUD I, wilderness management, to LUD IV, emphasizing maximum resource development with appropriate environmental constraints. *The Frosty Study Area is a LUD IV area.*

A position paper was developed for the Cleveland Timber Sale in December, 1982 and an interdisciplinary study team was formed in July, 1983. Public involvement in the process started in August, 1983 with letters sent to many groups and organizations, notice placed in local papers, and personal contact made with individuals who expressed interest.

The interdisciplinary team (IDT) evaluated several alternatives in an Environmental Assessment and recommended a timber harvest of approximately 31 million board feet (MMBF) in a single entry, along with the associated road system. The decision notice was signed by the Forest Supervisor in October, 1984 based on the team's recommendation. A copy of the Cleveland Decision Notice appears in Appendix A.

In conjunction with the timber sale analysis, a second IDT evaluated possible locations and designs for a facility in Frosty Bay to transfer the logs from land to saltwater. Their work resulted in an environmental assessment (EA) in 1984 addressing four sites and recommending a site on the south shore near the mouth of Frosty Bay. The decision notice (DN) was signed by the Stikine Area Forest Supervisor on August 6, 1984, selecting the south shore site with a temporary log crib bulkhead which would accommodate an A-frame, crane, or similar device for placing logs in the water. A copy of the decision notice for the log transfer facility (LTF) appears in Appendix B.

Because of poor market conditions and the lack of demand of timber sales in 1985, the Cleveland timber sale was deferred.

The Forest Plan was amended in 1985-86. At the same time the timber market in southeast Alaska showed signs of improving. The Cleveland timber sale was listed as a possible project to be offered for sale in 1990 and was renamed the Frosty timber sale. The Forest Service determined that the initial environmental analysis would be supplemented and an Environmental Impact Statement would be prepared for the Frosty sale. The Forest Service also determined that the original EA and DN for the log transfer facility were adequate. The permit needed to use the tidelands for the LTF was obtained and is still in effect.

Analysis Process

Forest Service specialists described the project to the public beginning with public notice in 1983. They followed up with letters, a newspaper article, and personal contacts to identify public issues associated with the proposed project.

More recent inventories and public scoping were conducted to supplement those done in 1983-84 to identify resource values and issues. The data was entered into a geographic information system (GIS). *The variety of data includes* stream zones, important wildlife habitat, timber and soil inventories, and location of proposed harvest units. This data was used to analyze the consequences or effects of each alternative and select the alternative preferred by the Forest Service.

Unit cards and road location cards were used to document the location of harvest units and roads throughout the life of the project. Resource specialists wrote their concerns on the cards and also recommended how their concerns should be treated. *Next the specialists worked together to iron out the final design of each unit and road segment. Detailed unit and road descriptions are included in the Final EIS.* The descriptions convey the planning intent behind the design of units and roads.

Inventories, reports, and other pertinent documents are part of the Frosty planning record and are available for public inspection at the Wrangell Ranger District Office in Wrangell, Alaska.

This Final EIS is tiered to the Forest Plan and the Forest Service's Alaska Regional Guide (November, 1983). Tiering means that the Final EIS will follow guidance provided in the Forest Plan and the Regional Guide. Relevant portions of those documents, and others, have been incorporated into the Final EIS by reference.

Issues

Issues were developed from public comments and internal discussion. Interdisciplinary team (IDT) members corresponded with at least twenty individuals, nine organizations, and four municipal, state, and federal agencies. A notice of intent to prepare an EIS was published in the Federal Register on March 21, 1989. Responses were received from one agency, three organizations, and 11 persons.

The IDT reviewed the public comments and used them to help identify the issues that need to be considered with the proposed timber sale. Alternatives were then designed to address the following issues to varying degrees:

Sale Profitability

Would a sale in the Frosty study area be profitable to both industry and the government? (Issue raised by Alaska Lumber and Pulp company)

Analysis will focus on meeting the mid-market test for profitability to business, and on return to government.

Visual Quality

How should timber management activities be designed to protect visual quality and what effect would activities have on the landscapes of the Frosty Study Area, especially as seen from Frosty Bay and Seward Passage? (Issue raised at meeting of Thoms Place residents)

Visual Quality Objectives (VQOs) will be used to evaluate visual quality. Factors to be considered include visibility, visual variety in the area, and the ability of the area to absorb or mask management activities.

Chapter 1

Purpose and Need

Fish

***How should fish habitat be managed and what effects would timber harvest and related activities have on fish habitat?* (Issue raised by Alaska Department of Fish and Game)**

Indicators of responsiveness to this issue are the miles of fish streams that would have timber harvest close enough to require streamside buffers and the number of road crossings on fish streams.

Wildlife Habitat

***How should wildlife habitat be managed and what effects would timber harvest and related activities have on wildlife habitat?* (Issue raised by Alaska Department of Fish and Game)**

Management indicator species have been identified to reflect the wide variety of wildlife species indigenous to southeast Alaska. Responsiveness to the wildlife habitat issue will be evaluated by comparing the amount of habitat for these species that would be disturbed. Analysis will include Sitka black-tailed deer and marten winter range; black bear denning sites; Vancouver Canada goose breeding, nesting, and rearing areas; and bald eagles.

Frosty Bay Anchorage

***How will the proposed project affect protection from wind in the Frosty Bay anchorage, and how can the timber sale be designed to protect the anchorage?* (Issue raised by a trapper who uses the bay)**

Protection of boaters from wind in Frosty Bay is dependent on the presence of trees to reduce the effect of wind sweeping across the Bay. The risk of losing the protection is analyzed in terms of number of acres of trees removed in the vicinity of Frosty Bay.

Opportunities

Four other resource opportunities were identified during the analysis:

(1) the development of a fish pass on Frosty Creek which would allow coho salmon and steelhead trout to reach potential fish habitat located above a series of barrier falls;

(2) the development of a trail system connecting the road at Unit 14A to Boulder Lake, then down to Anan Lake, and finally to the area near Anan *(this may include leaving in part of the portable bridge over a tributary to Frosty Creek near Unit 13B to provide trail access across the tributary);*

(3) the design of a sale administration cabin for use as a recreation cabin after sale activities are completed; and

(4) monitoring impact of timber activities on breeding geese, and if necessary, subsequent nesting area enhancement.

These opportunities are possibilities for future decisions and are not analyzed in this Final EIS. Additional NEPA documentation may be required to approve implementation.

Approvals Required From Other Agencies

A number of agencies have provided information for this EIS, including the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, and the Alaska Department of Natural Resources. The Forest Service also consulted with the State of Alaska through the Department of Governmental Coordination to ensure the project was consistent with the Alaska Coastal Management Plan.

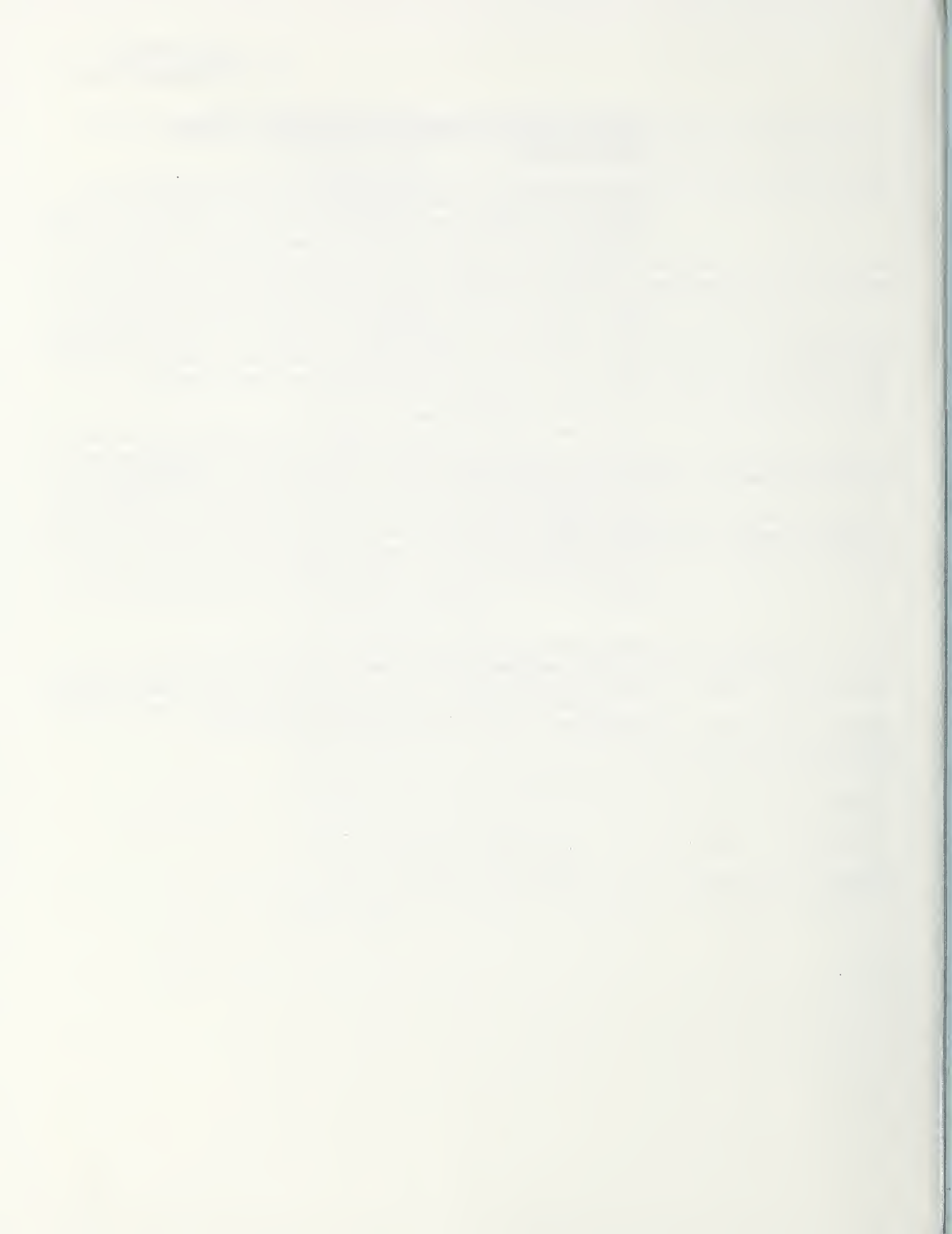
As the lead agency for this environmental compliance action, the Forest Service is responsible for the preparation of the EIS. The Forest Service will make a decision based on the EIS, to be documented in a Record of Decision (ROD). The Forest Service is also responsible for acquiring permits from the U.S. Army Corps of Engineers and the Alaska Department of Environmental Conservation. Each of these agencies makes its own decision about whether to issue the following permits:

U.S. Army Corps of Engineers:

●A single permit from the Corps incorporates requirements for the Clean Water Act and the Rivers and Harbors Act. It also includes U.S. Environmental Protection Agency permits for pollution discharge elimination and spill prevention control and countermeasure. In addition, the Corps permit covers the Alaska Department of Environmental Conservation certificate of reasonable assurance for compliance with Alaska water quality standards. This permit has already been obtained based on the Log Transfer Facility (LTF) analysis in 1984. *A new LTF design has been proposed within the area already permitted. The new design would have less impact on the tidal area. A request to change the design will be forwarded to the Corps of Engineers for their approval.*

State of Alaska Division of Governmental Coordination:

●A review coordinated by ADGC determines whether the State agencies agree with the Forest Service determination of consistency with the Alaska Coastal Management Plan. The permit for the log transfer facility has already been obtained, as has the State tidelands easement grant for the use of State tidelands.



Chapter 2

Alternatives

Introduction

This chapter describes alternative methods of providing a short-term timber sale for the independent logging community in the Frosty study area.

Process Used to Formulate Alternatives

Four timber-harvest alternatives were developed to respond, to varying degrees, to the issues described in Chapter 1.

***Alternative 1** was designed as the no-action alternative, in which no timber would be harvested and management would continue as before.

Sale Profitable? No sale

Visual Quality: Exceed inventory VQOs

Fish: No impact

Wildlife Habitat: No impact

Anchorage: No impact*

***Alternative 2** was designed as the maximum timber harvest alternative while protecting other resource values and conforming with the Forest Plan. It was based on Alternative D, the preferred alternative from the Cleveland Analysis, and was modified to meet Aquatic Habitat Management Unit (AHMU) guidelines.

Sale Profitable? Yes

Visual Quality: Do not meet inventory VQOs

Fish: AHMU buffers applied throughout, some harvest on high-hazard soils

Wildlife Habitat: Some high value wildlife habitat harvested

Anchorage: Allow harvest near bay that could increase risk of wind sweeping across bay*

***Alternative 3**, the preferred alternative in the Draft EIS, was designed as a compromise between Alternatives 2 and 4, intended to harvest more timber than Alternative 4 and have less impact on other resources than Alternative 2.

Sale Profitable? Yes

Visual Quality: Meets inventory VQOs

Fish: AHMU buffers applied throughout, same harvest on high-hazard soils

Wildlife Habitat: Less high value wildlife habitat harvested than Alternative 2

Anchorage: Do not allow harvest near bay that could increase risk of wind sweeping across bay*

***Alternative 3a** was developed in response to comments on the Draft EIS. The design was patterned after Alternative 3. It would harvest 260 acres of the 574 acre helicopter option and provide more protection for wildlife than Alternative 3.

Sale Profitable? Yes

Visual Quality: Meets inventory VQOs

Fish: AHMU buffers applied throughout, least harvest on high-hazard soils

Wildlife Habitat: Less high value wildlife habitat harvested than Alternative 3

Anchorage: Do not allow harvest near bay that could increase risk of wind sweeping across bay*

***Alternative 4** was designed to have the least possible impact on wildlife habitat while still maintaining a viable timber sale.

Sale Profitable? Yes

Visual Quality: Exceeds inventory VQOs

Fish: AHMU buffers applied throughout, less harvest on high-hazard soils than Alternative 3.

Wildlife Habitat: No high value wildlife habitat harvested

Anchorage: Do not allow harvest near bay that could increase risk of wind sweeping across bay*

Range of Alternatives

The range of alternatives, as a whole, addresses the issues identified in Chapter 1. The volume of timber to be harvested ranges from 26 MMBF to 40 MMBF and the no-action alternative describes the effects of choosing not to prepare a timber sale. Alternatives 2, 3, and 4, would harvest 12 MMBF with a helicopter yarding system while Alternative 3a would harvest 5 MMBF with the helicopter system. The number and shape of units also varies by alternative, as does the amount of wildlife habitat from which trees would be harvested and the amount of protection provided for fish remains constant in each action-alternative. Aquatic Habitat Management Unit (AHMU) guidelines will be followed in all action alternatives. Each action-alternative is consistent with LUD IV guidelines for development in the Forest Plan.

Alternatives Considered but Eliminated from Detailed Study

The Forest Service considered a range of alternatives in order to identify the reasonable alternatives to be studied in detail. Those alternatives eliminated from detailed study, along with the rationale for their dismissal, are as follows:

Cleveland Preferred Alternative

In the Cleveland Decision Notice of 1984, Alternative D was selected as the alternative preferred by the Forest Service. This alternative was not considered in detail in the Frosty EIS because it is no longer consistent with current policy of stream-side management with aquatic habitat management units (AHMUs).

**Maximize Timber
Harvest**

This alternative was not studied in detail because it would harvest virtually all the operable high-volume, old-growth stands. A preliminary economic analysis indicated that the inclusion of certain road sections to harvest isolated timber stands would not make an economically viable timber sale. In addition, it would not allow for retention of wildlife habitat or scenic and recreation values consistent with the Forest Plan. There would be an unacceptable risk of impacts to the fisheries resource because of increased stream crossings and increased harvest within stream-side zones.

**Alter Land Use
Designations**

The Frosty study area must be managed as defined in the Forest Plan, consistent with land-use-designation IV (LUD IV). It is possible to change LUDs by *revising or amending the Forest Plan,* however, there was no public comment or internal concern suggesting that the LUD be changed. For a change to occur, this sale would have to be deferred while the Forest Plan was amended.

Partial Cutting

Trees in southeast Alaska are shallow-rooted and susceptible to windthrow. When partial cutting systems are *used,* not only are harvested stands subject to increased windthrow, but injury to the *remaining* stand can be significant. Unless there are specific resource concerns or opportunities which would warrant the use of partial cutting, it is not considered a desirable method of harvest *for widespread use on a timber sale in this area. Partial cutting will be used in some of the buffer strips in the Frosty study area in order to provide a feathered edge that may be more windfirm along streams and the no-cut buffer strips.*

Identification of the Forest Service Preferred Alternative

Draft EIS

On September 15, 1989, the Frosty IDT met with the Forest Supervisor and staff officers to select the alternative preferred by the Forest Service. The group decided to consider the addition of helicopter units to take advantage of favorable market conditions. Prices are currently high enough to make such a sale economical. An analysis of the helicopter units shows that most of the units would be viable additions. The impacts associated with them should be less than the high-lead units because there would be no additional road construction associated with the helicopter units, and because helicopter yarding fully suspends the logs off the ground. If they are not harvested at this time, a second opportunity may not be available any time soon. The helicopter units were then added to the environmental analysis as an option to each action alternative. Some or all of the helicopter units would be selected for harvest based on resource impacts and economic considerations.

After reviewing all resource impacts, consequences, and opportunities, Alternative 3 was identified as the preferred alternative in the Draft EIS. The helicopter option was also recommended along with Alternative 3.

Final EIS

In response to comments on the Draft EIS, Alternative 3a was developed. It is similar to Alternative 3, the preferred Alternative in the Draft EIS. The new alternative would have less impact on resources than Alternative 3.

The alternative preferred by the Forest Service is Alternative 3a, which includes 260 acres of the 574-acre helicopter option. It offers the best opportunity to provide timber volume for the needs of industry while adequately protecting other resources and uses in conformance with the Forest Plan.

Mitigation

The following steps are required as part of the sale and layout requirements to mitigate consequences, pending incorporation into the Record of Decision (ROD) by the Stikine Area Forest Supervisor:

- (a) The contractor will be required to *select a camp location that does not affect the long term visual quality of Frosty Bay or Seward Passage. Options include a floating camp and an inland camp. A proposed inland location is near Unit 5 (see Unit Description in Appendix E).*
- (b) If *requested by contractor,* a sortyard could be located for sorting logs prior to placement in water. One possible location is near Unit 5. Any location selected should not have an impact on the view from Frosty Bay.
- (c) The log transfer facility and bridges will be temporary structures.
- (d) The Forest Service administrative facility will be designed for use as a recreational cabin once administration has been completed. Landscape design principles will be used in the design and siting of the administrative cabin.
- (e) Minimum 330-foot buffers will be maintained around eagle nest trees.
- (f) *Goose nesting will be protected with the use of timing restrictions on timber harvest and road construction activities from April 1 to June 15 in units and along roads. These are described in the Unit and Road Descriptions in Appendices E and F, and include Units 9, 10A, 10B, 12B, 13B, and 14A, and Roads 6850 and 54501.*
- (g) *Goat rearing and winter range will be protected with the use of timing restrictions on timber harvest in Unit 22 between December 1 and July 1.*
- (h) *Timber harvest and road building activities will be reported to the Alaska Department of Fish and Game (ADFG) so they can coordinate any hunting restrictions in the Frosty Study Area.*
- (i) *All known or discovered* cultural sites will be protected. If additional sites are discovered once the sale is in operation, protective measures will be taken.
- (j) Aquatic Habitat Management Unit (AHMU) guidelines will be followed for harvest near Class 1, Class 2, and Class 3 streams.
- (k) *The sale area improvement plan should consider the following specific projects in addition to the generally required projects:
 - *Analysis of* construction of a fish pass over the first barrier falls in Frosty Creek, *and pending results of analysis, building a fish pass.*
 - Evaluation of impacts associated with timber harvest activities on breeding Vancouver Canada geese within the sale area, *and if this study indicates a need, a habitat improvement project(s) for geese.*

- *Evaluation of the effectiveness of AHMU buffer strips.*
 - *Evaluation of impacts of management on the visual resource, and update of Existing Visual Condition maps.*
 - Trail construction from Unit 14A to the Anan area.
 - Moving the administration cabin to a site suitable for a recreation cabin once administrative activities are completed
- (l) *The visual resource will be protected to the extent required to meet the visual quality objectives for the Frosty area.* Landscape design principles will be used in the design and rehabilitation of the log transfer facility, rock pits, and harvest units.
- (m) *Rehabilitation of Rock Pit Near Log Transfer Facility. Objective: To meet a VQO of Modification in the foreground distance zone (0 - ½ mile) as seen from Frosty Bay by screening the rock pit with vegetation.*
1. *Maintain existing vegetation between road and beach in front of rock pit.*
 2. *Store overburden where it will be screened to views from Frosty Bay.*
 3. *Return overburden to pit floor and seed. If topography allows, store overburden along western edge of pit, push down over backwall, and spread over pit floor. The intent is to allow soil to catch in ledges of the backwall, quickening revegetation of that wall. If a field check indicates the need for further screening, some overburden may be distributed along the entryway to the pit and planted with alder.*

Monitoring

Implementation Monitoring

In preparing the Frosty Timber Sale, specialists used on-the-ground inventories, computer inventories, and aerial photographs to prepare cards for each harvest unit. Cards were also prepared for each segment of road. Resource specialists wrote their concerns on the cards and then described how the concerns could be addressed in the design of each unit and road segment. These documents will be used as guidelines in monitoring the harvest of timber in the Frosty area.

Following completion of harvest activity, development impacts will be compared to those described in the Frosty EIS to identify significant differences from what was anticipated. Once again, this information, when and where pertinent, will be noted and added on the unit and road cards. By the end of the timber sale activities, the cards will document the initial plan, the rationale for any changes, and show the project as implemented.

Effectiveness Monitoring

Effectiveness monitoring measures the effectiveness of design features or mitigation measures. The following effectiveness monitoring will be performed following implementation of an action alternative:

- (a) The mitigation measures for protecting the habitat of the Vancouver Canada Goose will be monitored to identify impact of timber harvest and road construction activities.
- (b) The effectiveness of various AHMU buffers will be monitored by the IDT within one year of completion of harvest activities, and again within five years. Special attention will be focussed on Units 9, 10A, and 17.

Alternatives Considered in Detail

The Forest Service developed four alternatives for detailed analysis *in the Draft EIS.* In addition, a helicopter option was added to each action alternative. *A fifth alternative was formulated in response to comments on the Draft EIS. Because the new alternative is similar to Alternative 3, it is named Alternative 3a. Each of these provides for protection of resources; each responds to resource management opportunities such as timber harvest, wildlife habitat management, and visual quality management; and each addresses issues the public and management identified in Chapter 1. However each alternative provides a different mix of resource outputs that emphasize different resource values. Each alternative responds to some or all of the issues developed during scoping (see Chapter 1), and each includes a map for reference.

Assuming an action alternative is selected and the Frosty timber sale is harvested, there will be some minor changes to the units and roads as they are described in this Final EIS. It is impossible to put these plans into effect on the ground without responding to surprises that were not anticipated. Sometimes this means developing additional protection for a resource value that had not been recognized, and sometimes it may mean harvesting a few more trees if it can be accomplished without changing the environmental impacts. Thus all boundaries, acreages, volumes, and road locations should be considered "best estimates" at the time the Final EIS was published.

Spur roads are not displayed on Maps 2-2 through 2-4 because their locations may change, with Forest Service approval, according to operator needs and equipment requirements. The spur road mileage listed is an estimate of the amount of road a prudent operator may require.

Alternative #1

No Action

No action means there would be no road construction and no timber harvest. Alternative 1 was evaluated to assess the impact of allowing the current management in the area to continue without a timber sale, and to provide baseline information against which other alternatives would be measured. Chapter 3 contains a summary of the current conditions in the Frosty Study Area and Chapter 4 describes changes likely under current management. A map of the Frosty study area is shown facing the inside front cover (Map 2-1).

Common to Alternatives 2, 3, 3a, and 4

Some of the major items common to alternatives 2, 3, 3a, and 4:

- (a) Harvest was considered only on the 40 percent of the Frosty study area classified as operable, commercial forest land and suitable for timber management.
- (b) Design includes location of a sortyard which will be used to store and sort logs prior to assembly into rafts.

Chapter 2 Alternatives

- (c) The road system would start from a log transfer facility (LTF) located in Frosty Bay. The LTF and bridges will be temporary structures because they cost less than permanent structures and would not be used for quite some time following the initial entry.
- (d) Harvest and road construction activities would avoid known cultural sites and a minimum 330 foot buffer around eagle nest trees
- (e) Stream protection would include provision of buffer areas and other protective actions consistent with aquatic habitat management unit (AHMU) guidelines pertaining to (1) unstable banks, (2) temperature sensitivity, and (3) large, woody debris for rearing habitat
- (f) Boundaries on units have been adjusted to reduce the impact on the view as seen from Frosty Bay and Seward Passage
- (g) The sale administration cabin will be located and designed to serve as a recreation cabin after administration of the sale is completed.



Chapter 2 Alternatives

Alternative #2 Largest Timber Sale of the Action Alternatives

ALL LOGGING SYSTEMS

- *40 MMBF timber
- 2013 acres land
- 14.0 miles specified¹ road
- 11.0 miles spur² road*

HELICOPTER LOGGING

- *12 MMBF timber
- 574 acres land*

Of the four action alternatives, this provides the largest timber sale. It is a modification of the alternative selected in the original Cleveland Decision Notice in 1984. Alternative 2 harvests trees along the southwest edge of Frosty Bay and there is some risk that this could allow wind to blow across the Frosty Bay anchorage.

A number of features have been added to the old Cleveland preferred alternative in order to address concerns that have arisen during the past five years. These features include the items listed on the previous page under "common to alternatives 2, 3, 3a, and 4."

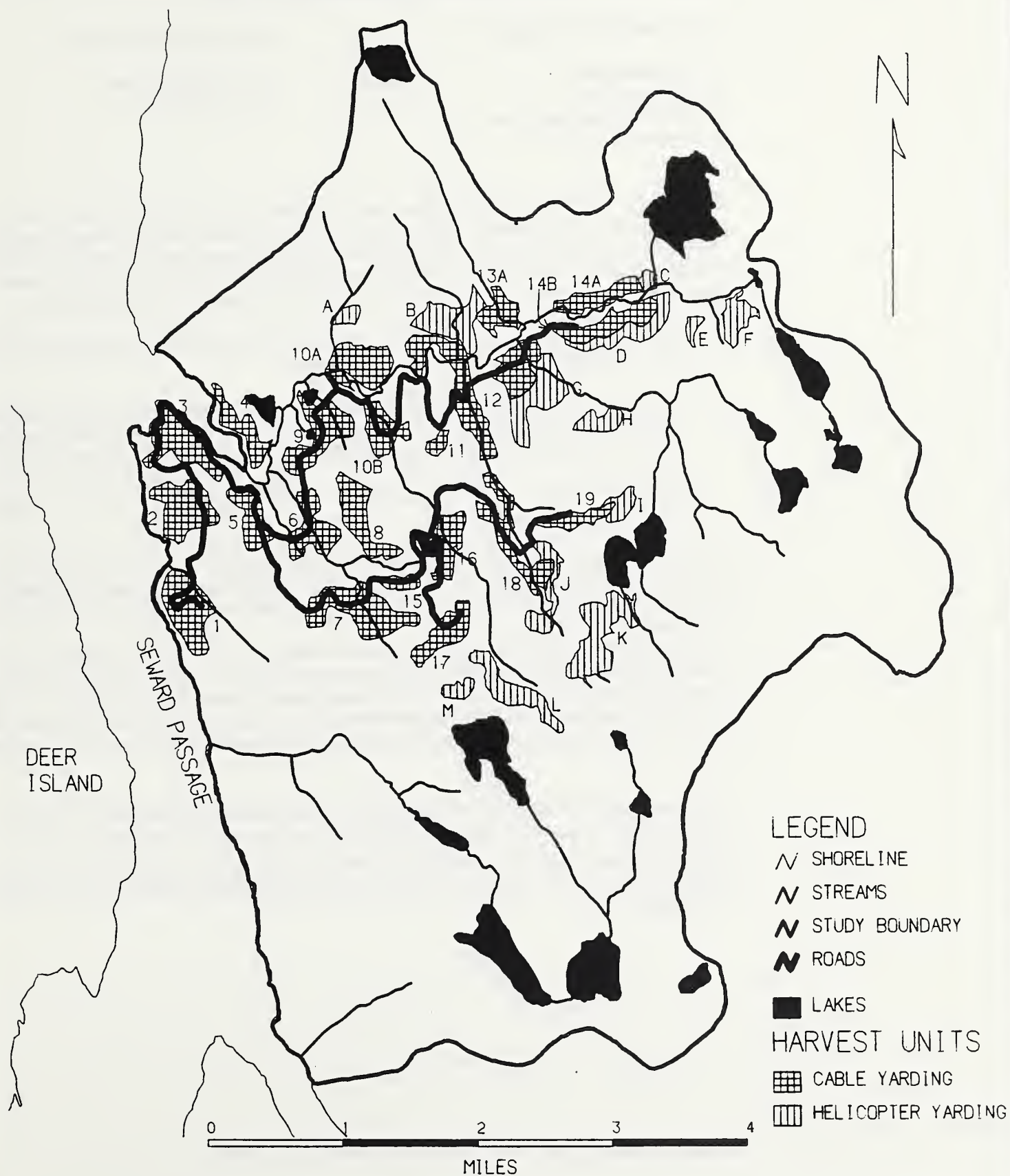
If the helicopter option were added to Alternative 2 there would be six units exceeding the 100-acre size limit described in the National Forest Management Act. Five of the larger units, however, are less than 150 acres, the maximum size that can be approved by a Forest Supervisor. The larger units were designed to improve the economics of the sale and to take advantage of natural features to reduce the chance that surrounding trees would be blown down after the unit is harvested. One of the units would be 230 acres and would require approval by the Regional Forester.

Alternative 2 would harvest 27 percent of the operable CFL. For the purposes of cumulative effects analysis, the harvest scenario assumes that a second entry would remove the remaining economical volume in 50 years, except for the area retained for old-growth dependent species. (See Map 4-2 for areas retained for wildlife habitat in Alternative 3a. Alternative 2 would harvest some of these retention areas, however, a retention map for Alternative 2 would be similar to Map 4-2). Map 2-2 displays the unit locations, LTF, and specified road system as designed.

¹ The location of the road and the construction requirements are specified by the Forest Service. Specified roads are sometimes referred to as permanent or system roads.

² Spur roads are designed for short term project needs to provide access between harvest units and specified roads. Spur roads are sometimes referred to as temporary or non-system roads.

Map 2-2. Alternative 2



MAPSCALE 1:63360

Chapter 2 Alternatives

*Alternative #3a

Smallest Timber Sale of the Action Alternatives. (This is the preferred alternative in the Final EIS.)

ALL LOGGING SYSTEMS

- **26 MMBF timber*
- *1273 acres land*
- *12.2 miles specified¹ road*
- *7.1 miles spur² road**

HELICOPTER LOGGING

- **5 MMBF timber*
- *260 acres land**

This alternative provides for less timber than Alternatives 2, 3, and 4. In addition to resource protection described in Alternative 3 and in the section "Common to Alternatives 2, 3, 3a, and 4, Alternative 3a includes the following features:

1. In the Draft EIS, helicopter units were identified with letters, beginning with A. In Alternative 3a of the Final EIS, the helicopter units are identified with numbers rather than letters. Approximately 260 acres from the helicopter option are included in this alternative.
2. Acreage is trimmed from units 1, 2, and 3 to provide a larger beach fringe buffer to further mitigate wildlife and visual concerns.
3. Additional buffers were added to streams in Units 12B, 13B, 16, and 21 (Unit K in the Draft EIS). Each of these units has become smaller as a result.
4. Over 1/2 of Unit 18 was dropped to avoid high soil hazards adjacent to a stream.
5. On Unit 8, dropped two settings on south end and added one setting on north end in order to decrease the length of spur road needed.
6. Developed a new road route to provide access to Units 1 and 2 to reduce impacts on wildlife habitat and visual quality.

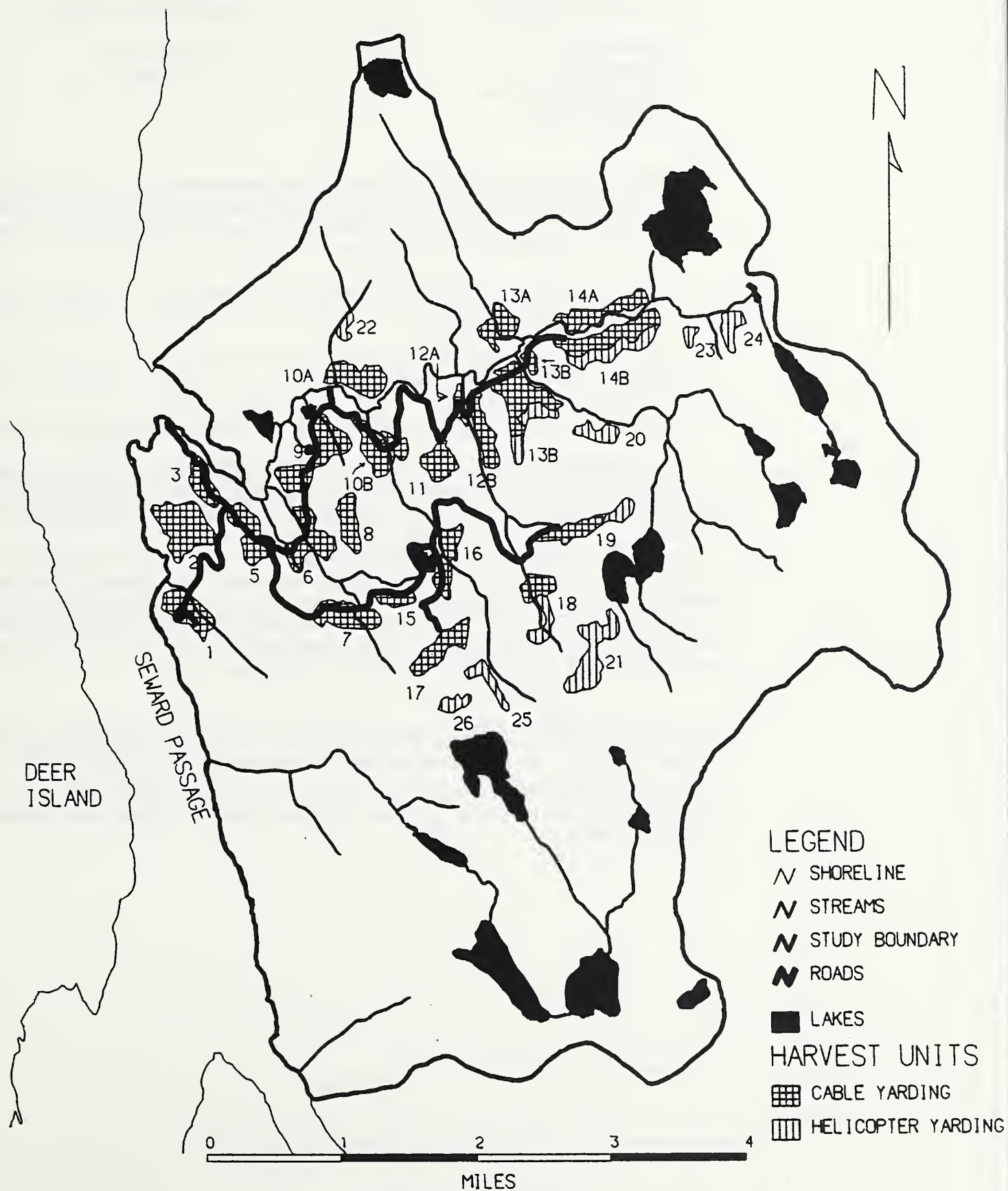
If the helicopter option were added to Alternative 3a there would be four units exceeding the 100-acre size limit described in the National Forest Management Act. Each of the larger units, however, is less than 150 acres, the maximum size that can be approved by a Forest Supervisor.

Alternative 3a would harvest 17 percent of the operable CFL. For the purposes of cumulative effects analysis, the harvest scenario assumes second entry in 30 years to take one-third remaining volume, third entry in 60 years to take second one-third, fourth entry in 90 years to take final one-third, except for the area retained for old-growth dependent species (see Map 4-2). Map 2-3a displays the unit locations, LTF, and specified road system as designed.

¹ The location of the road and the construction requirements are specified by the Forest Service. Specified roads are sometimes referred to as permanent or system roads.

² Spur roads are usually less than 1/2 mile long. The location is selected by the contractor and approved by the Forest Service. Spur roads are sometimes referred to as temporary or non-system roads.

Map 2-3a. Alternative 3a



Chapter 2 Alternatives

Alternative #4	Smaller Timber Sale than Alternatives 2 and 3, Larger than Alternative 3a.	
	ALL LOGGING SYSTEMS	*HELICOPTER LOGGING*
	<ul style="list-style-type: none">● *29 MMBF timber● 1436 acres land● 11.6 miles specified¹ road● 5.7 miles spur² road*	<ul style="list-style-type: none">● *12 MMBF timber● 574 acres land*

This alternative provides for less timber harvest than Alternatives 2 or 3. It also has less impact on wildlife habitat and on views as seen from Seward Passage. In addition to resource protection described in Alternative 3 and the section "Common to Alternatives 2, 3, 3a, and 4, Alternative 4 provides the following features:

1. Unit 10-A would be left standing for bear denning as requested by Alaska Department of Fish and Game.
2. The north half of Unit 14 is left standing to keep the south-facing slope available for deer habitat and to avoid stream crossing.
3. Units 1 and 2 are left standing to protect the view as seen from Seward Passage.

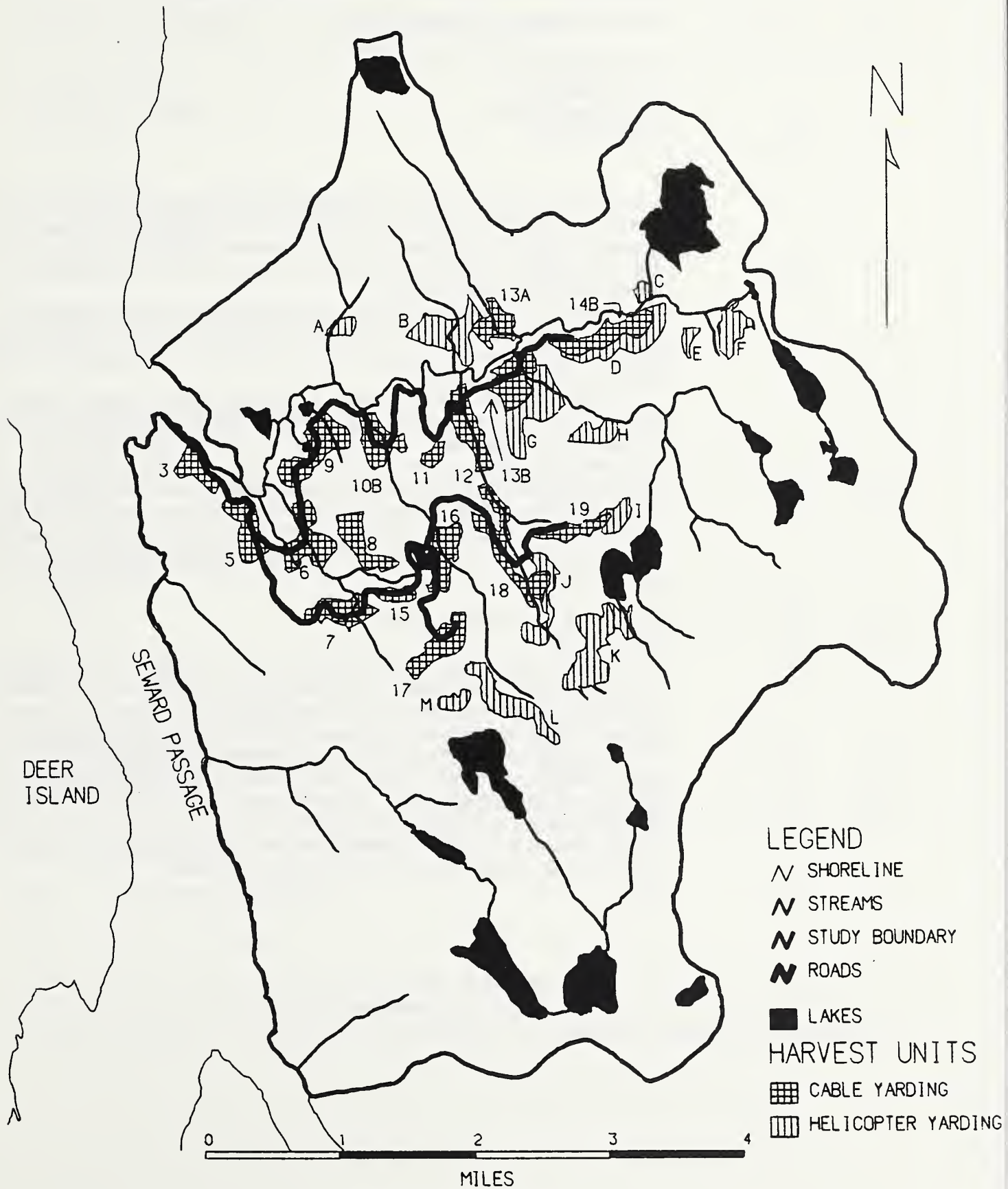
If the helicopter option were added to Alternative 4 there would be four units exceeding the 100-acre size limit described in the National Forest Management Act. Each of the larger units, however, is less than 150 acres, the maximum size that can be approved by a Forest Supervisor.

Alternative 4 would harvest 19 percent of the operable CFL. For the purposes of cumulative effects analysis, the projected harvest scenario is the same as in Alternative 3: assumes second entry in 30 years to harvest one-third of the remaining volume, third entry in 60 years to harvest second one-third, and fourth entry in 90 years to harvest final one-third, except for the area retained for old-growth dependent species (see Map 4-2). Map 2-4 displays the unit locations, LTF, and specified road system as designed.

¹ The location of the road and the construction requirements are specified by the Forest Service. Specified roads are sometimes referred to as permanent or system roads.

² Spur roads are usually less than 1/2 mile long. The location is selected by the contractor and approved by the Forest Service. Spur roads are sometimes referred to as temporary or non-system roads.

Map 2-4. Alternative 4



Chapter 2 Alternatives

Helicopter Option

Additional Volume To Meet Forest Plan Objective to Harvest Less-Economical Areas When Possible. Available Due to Favorable Market.

DRAFT EIS HELICOPTER LOGGING

- 12.0 MMBF timber
- 574 acres land
- no specified road
- no spur road

Under normal market conditions helicopter units would not be economical to harvest. Helicopter logging was considered in each of the Frosty action alternatives in order to meet a Forest Plan objective to harvest less-economical areas when possible. This opportunity is available now because improved market conditions make the units more economically attractive.

Helicopter units are described as an option because some or all of the 574 acres could be added to each of the action alternatives. Helicopter units adjacent to units 13A, 13B, 14B, and 18 would make the size of these units greater than 100 acres in each action alternative.

There would be no need to construct additional road. If helicopter units are found to be on high-hazard soils and this impact cannot be mitigated, they will be dropped from consideration.

Helicopter logging would normally be too expensive to be economical in the Frosty area, however the cost of this volume would be averaged along with the less-expensive high-lead volume. If the helicopter units were deferred and sold separately at a later date, market conditions may not be the same and amortization of costs over more volume would not be possible. Roads and bridges would also have to be re-installed.

FINAL EIS HELICOPTER LOGGING

In the Draft EIS, helicopter harvest units were listed separately from each alternative and packaged as a "helicopter option" that could be added to any action alternative. In this Final EIS the helicopter option is described as part of each alternative in order to better assess the cumulative impacts of helicopter and high-lead logging together.

Field verification indicated that only 260 acres of the 574 acre helicopter option were feasible to harvest at this time. The remaining 314 acres were not included in the preferred alternative because they are located on steep slopes. Only the 260 feasible acres are incorporated into Alternative 3a. All 574 acres were incorporated into Alternatives 2, 3, and 4 to remain consistent with the Draft EIS, and so the consequences analysis would not have to be re-calculated.

Table 2-1. Summary of Consequences

ELEMENT OF PROPOSAL	ALT 1	ALT 2	ALT 3	*ALT 3a*	ALT 4
TIMBER HARVEST					
Total Volume ¹ (MMBF)	0	40	34	26	29
Harvest Acres	0	2013	1707	1273	1436
Area Harvested:					
Total Commercial Forest Land (CFL) (out of 9882 acres)					
acres	0	2013	1707	1273	1436
percent	0%	20%	17%	13%	15%
Operable CFL (out of 7431 acres)					
acres	0	2013	1707	1273	1436
percent	0%	27%	23%	17%	19%
Normal CFL (can be harvested with standard cable logging systems) (out of 3230 acres)					
acres	0	1439	1133	1013	862
percent	0%	45%	35%	31%	27%
Non-Standard CFL (requires heli- copter, balloon, long-span, etc.)(out of 4201 acres)					
acres	0	574	574	260	574
percent	0%	14%	14%	6%	14%
Units over 100 acres	0	6	4	4	4
Percent Harvest by Volume Class					
4: 8-20,000 BF/acre	0%	39%	41%	40% ²	42%
5: 20-30,000 BF/acre	0%	44%	43%	45%	39%
6: 30-50,000 BF/acre	0%	17%	16%	15%	19%
	0%	100%	100%	100%	100%
ROAD CONSTRUCTION					
Miles of Specified Road Construction	0	14.0	14.0	12.2	11.6
Miles of Spur Road Construction	0	11.0	7.4	7.1	5.7

¹ Volume estimates are taken from a computer database and are considered to be conservative. Actual volume may prove to be higher when the units are cruised on the ground.

² Acreage of volume class "0" included with volume class 4. For explanation, see first page of Appendix E, Unit and Road Descriptions.

Chapter 2 Alternatives

Table 2-1. Summary of Consequences (continued)

CONSEQUENCES	ALT 1	ALT 2	ALT 3	*ALT 3a*	ALT 4
WATERSHED SENSITIVITY					
Extent of Harvest in Each Watershed					
Frosty Creek (11,179 acres)					
Acres	0	1699	1521	1361	1396
Percent	0%	15.2%	13.6%	12.2%	12.5%
Unnamed Creek 1 (432 acres)					
Acres	0	49	44	41	0
Percent	0%	11.3%	10.2%	9.5%	0%
Acres Between Watersheds (drains directly into saltwater; no effect on inventoried streams)	0	265	142	131	40
Total	0	2013	1707	1533	1436
WATER QUALITY/FISH HABITAT					
Miles of Class 1 Stream Requiring AHMU Prescriptions	0	1.0	0.9	0.9	0.5
Miles of Road Built within Class 1 AHMU	0	0.6	0.2	0.2	0.2
Number of Road Crossings of Class 1 Streams	0	2	2	2	1
DEER HABITAT					
Acres of Deer Winter Range Harvested	0	1654	1399	1053	1128
Percent of Deer Winter Range Harvested	0%	16%	13%	10%	11%
Number of Deer Area Could Support:					
Mild Winter	811	705	724	744	745
Moderate Winter	356	285	298	312	313
Severe Winter	136	94	102	111	110
Relative Impact on Resident Deer Population (none/minor/major)	none	major	minor	minor	minor

Table 2-1. Summary of Consequences (continued)

CONSEQUENCES	ALT 1	ALT 2	ALT 3	*ALT 3a*	ALT 4
MARTEN HABITAT					
Acres of Marten Winter Range Harvested	0	1870	1542	1089	1216
Percent of Marten Winter Range Harvested	0%	16%	13%	9%	10%
Number of Marten Area Could Support	36	30	31	32	32
Relative Impact on Resident Marten Population (none/minor/major)	none	minor	minor	minor	minor
GOOSE HABITAT					
The habitat requirements of the Vancouver Canada goose are not well understood. Consequently, figures are not available for (1) the proportion of habitat harvested and (2) the number of geese supported in each alternative. To learn more about the impacts of timber harvest on the Canada goose, the Frosty area goose population will be monitored during harvest activities. *Monitoring has begun and preliminary estimates suggest that there are 5-10 nesting pairs and 40-60 moulting, non-breeding birds. This is fewer than originally suspected.*					
BEAR HABITAT					
Acres of High-volume Old Growth Harvested	0	339	280	187	276
Percent of High-volume Old Growth Harvested	0%	35%	29%	19%	28%
Relative Impact on Resident Bear Population (none/minor/major)	none	minor	minor	minor	minor
EAGLE HABITAT					
Acres of Beach Fringe Nesting Habitat Harvested	0	80	13	13	0
Percent of Beach Fringe Nesting Habitat Harvested	0%	16%	3%	3%	0%
Number of Eagle Nest Trees Requiring Buffer Zones	0	3	2	2	0
Relative Impact on Resident Eagle Population (none/minor/major)	none	minor	minor	minor	none
SUBSISTENCE					
Extent of Impact on Subsistence Use (none/minor/major)	none	minor	minor	minor	minor

Table 2-1. Summary of Consequences (continued)

CONSEQUENCES	ALT 1	ALT 2	ALT 3	*ALT 3a*	ALT 4
VISUAL QUALITY					
Impact is less than (-), greater than (+) or equal to (=) Inventory VQO					
Areas Viewed from Frosty Bay	-	+	=	=	=
Areas Viewed from Seward Passage	-	+	=	=	=/- ¹
Areas not Generally Seen	-	=	=	=	=
ECONOMIC FACTORS					
Total Pond Log Selling Value (\$ million)	0	14.5	12.4	9.5	10.6
Total Costs to Operator Including Profit & Risk (\$ million)	0	12.5	10.9	8.3	9.3
Possible Return to Government (\$ thousand)	0	2044	1564	1022	1296
EMPLOYMENT					
Number of Jobs Generated	0	280	238	182	203
Dollar Value of Jobs (\$ million)	0	6.44	5.47	4.19	4.67
Dollar Value Secondary (\$ million)	0	45.08	38.29	29.30	32.69

¹ Impact is equal to Inventory VQO north of Need Point and has less impact than Inventory VQO south of Need Point.

Summary of Harvest Units

*Tables 2-2 and 2-3 show the size of each harvest unit in each alternative. Table 2-2 shows the high-lead (cable) harvest units. Table 2-3 shows the helicopter units.

Note that in Table 2-3, units are identified with both letters and numbers. In the Draft EIS, helicopter units were designated with letters. This lettering system has been carried forward to the Final EIS for Alternatives 2, 3, and 4 to remain consistent with the Draft EIS. In Alternative 3a however, all units were assigned numbers, regardless of whether they were high-lead or helicopter. Table 2-3 shows what happened to the lettered helicopter units in the development of Alternative 3a. Some of the lettered helicopter units were eliminated or changed to high-lead and some high-lead areas were changed to helicopter.*

Table 2-2. High-lead (Cable) Harvest Units and Acres In Alternatives 2, 3, and 4. (High-lead and helicopter are both included for Alternative 3a.)¹

Unit	NUMBER OF ACRES			
	Alt 2 total	Alt 3 total	Alt 3a total(heli)	Alt 4 total
1	97	53	50	---
2	93	93	81	---
3	90	34	32	34
4	49	---	---	---
5	54	54	50	54
6	69	69	56	69
7	117	51	51	51
8	73	49	32	49
9	88	81	76	81
10A	83	75	52	---
10B	52	52	56	52
11	13	13	33	13
12	112	60	---	60
12B			50	
13A	41	41	38	41
13B	61	61	111(28)	61
14A	50	50	46	---
14B	65	65	102(40)	65
15	18	18	20	18
16	50	50	40	50
17	57	57	46	57
18	78	78	45(20)	78
19	30	30	47(13)	30
20			22(22)	
21			63(63)	
22			10(10)	
23			8(8)	
24			22(22)	
25			21(21)	
26			13(13)	
Total	1440	1134	1273(260)	863
Volume ² (mmbf)	28	22	21(5)	17
mbf/ acre	19.5	19.1	20.4	19.3

¹ Table 2-3 shows the acres of helicopter units for Alternatives 2, 3, and 4.

² Timber volumes are based on a computer database and are considered to be conservative. Volume estimates from an on-the-ground cruise may be higher.

Chapter 2 Alternatives

Table 2-3. Helicopter Units and Acres.

Alt 2,3,4 Unit	Alt 3a Unit	NUMBER OF ACRES	
		Alt 2,3,4 Acres	Alt 3a Acres
A	22	15	10
B	gone	77 ¹ (plus Unit 13A = 118 acres) ²	---
C	part of 14A ³	11	---
D	part of 14B	53 (plus Unit 14B = 118 acres) ²	40
E	23	11	8
F	24	38	22
G	part of 13B	85 (plus Unit 13B = 146 acres) ²	28
H	20	28	22
I	part of 19	23	13
J	part of 18	45 (plus Unit 18 = 123 acres) ²	20
K	21	105	63
L	25	67	21
M	26	16	13
Total		574	260
Volume ⁴ (mmbf)		12	5
mbf/ acre			21.2 21.2

¹ In Alternative 2, helicopter Unit B would be combined with conventional Units 12 and 13A for a total of 230 acres. Clearcuts larger than 150 acres must be authorized by the Regional Forester.

² Units greater than 100 acres in size must be approved by the Forest Supervisor.

³ Will be high-lead logged rather than helicopter logged.

⁴ Timber volumes are based on a computer database and are considered to be conservative. Volume estimates from an on-the-ground cruise may be higher.

Chapter 3

Affected Environment

Introduction

This chapter describes the environment of the the Frosty Study Area that would affect, or be affected by, any of the proposed alternatives. The information has been taken from more detailed reports that are available for public review in the planning record, located on the Wrangell Ranger District, Wrangell, Alaska.

Watershed

The Frosty area contains four watersheds. Two of these would be affected by the proposed project. The watershed for Frosty Creek is the largest, at 11,179 acres. A smaller, unnamed watershed would also be influenced (see Table 3-1 and Map 3-1).

Table 3-1. Watersheds in Frosty Study Area

Location	Watershed	Acres	Total Stream Length (ml)
Within Project	Frosty Creek	11,179	27.9
	Unnamed Creek 1	432	1.1
Outside Project	Unnamed Creek 2	3,832	6.3
	Unnamed Creek 3	490	1.0
Total Acres		15,933 ¹	

¹ The acreage for the combined watersheds does not match acreage for the entire study area boundary (18,611 acres) because the study area boundary does not precisely match the watershed boundaries.

Most of the stream length in the Frosty area is stable in the sense that (1) the stream segments are unlikely to meander because they are well-contained in channels and (2) the streambeds and streambanks are somewhat resistant to erosion because they are controlled by bedrock (see Table 3-2). This includes the mainstem of Frosty Creek and the higher-gradient tributaries. A smaller percentage of the stream length has banks that are dependent on riparian vegetation for stability and is therefore more sensitive to disturbance. These include the low to moderate-gradient channels in the middle reaches of the watershed.

Map 3-1. Watershed Boundaries

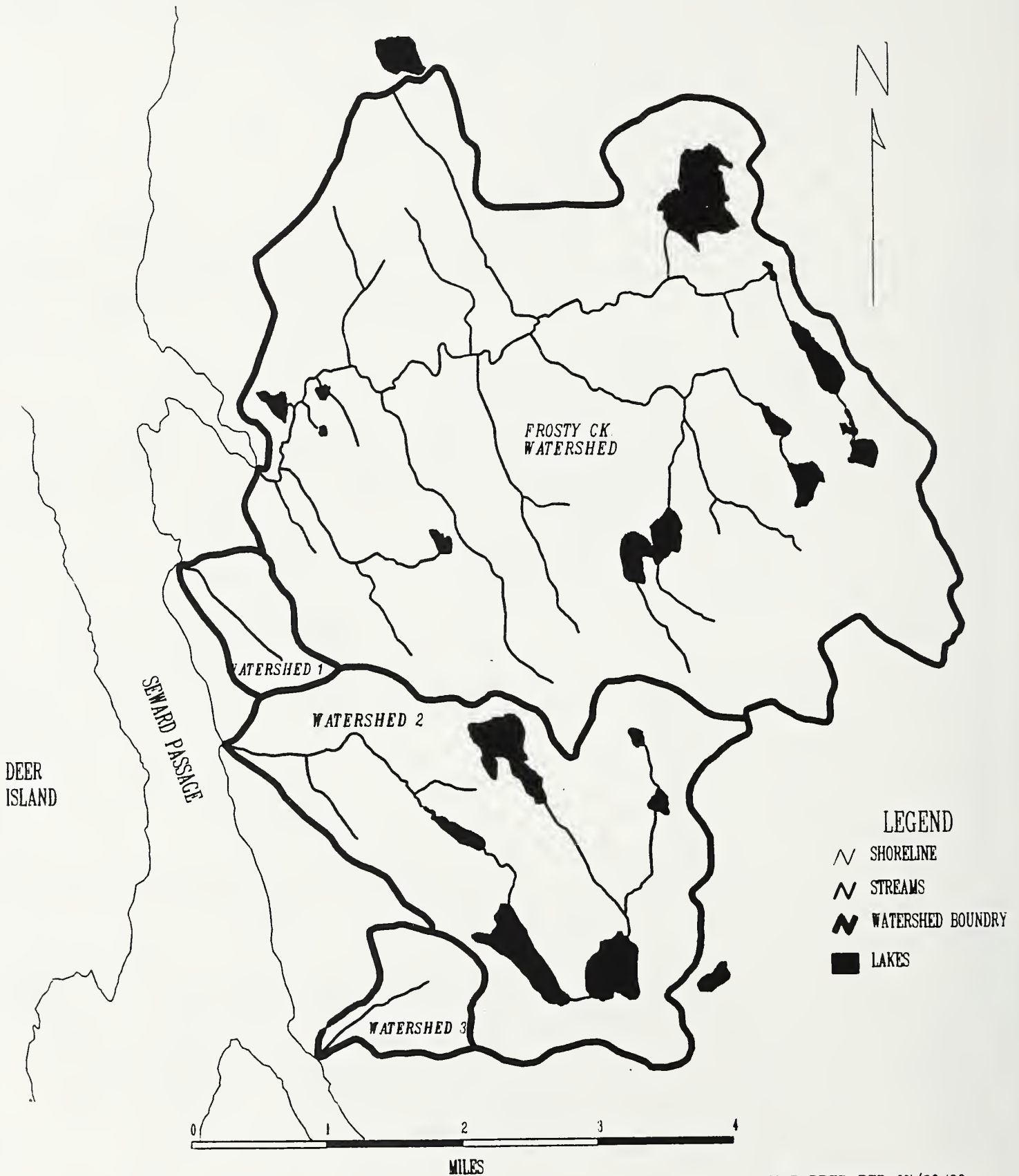


Table 3-2. Length of Stream (In miles) In Each Process Group¹ on Frosty Creek.

STREAMBANK SENSITIVITY	PROCESS GROUP ¹	FROSTY CREEK STREAM LENGTH
MORE SENSITIVE	1. Low Gradient Floodplain	2.9
	2. Alluvial Fan	1.5
	3. Mixed Control Moderate Gradient	.8
	7. Placid or Glide	.3
	8. Estuaries	.2
		= 20% stream length
LESS SENSITIVE	4. Large Low Gradient Contained	1.9
	5. Moderate Gradient Contained	5.6
	6. High Gradient Contained	14.7
		= 80% stream length

¹ The channel types have been grouped according to the stream processes that formed them. These processes reflect the long-term interaction of geology, landform, climate, and resultant vegetation patterns. See Appendix D for more detailed descriptions of the process groups.

Landform and Soils

The landforms in the area are similar to those found in other mainland valleys in southeast Alaska. Frosty Creek is in a glacial-carved U-shaped valley. Valley sideslopes are generally moderately steep and contain numerous very steep, bluff-like areas. Streams which flow into Frosty Creek often occur in deep, steep-sided, V-notched drainages. A broad plateau is found at elevations above 1000 feet, with abundant small hills and pot hole lakes.

Most forested soils in the area are typical of southeast Alaska and are topped by a thick organic layer which makes them resistant to surface erosion unless disturbed. In general, when the organic layer is disturbed and/or removed, the underlying mineral soils are sensitive to erosion.

Some typical mineral soils in the area have formed in place as a thin layer over the granite-like bedrock. Other areas have deeper soils deposited by the glaciers on the lower slopes. Muskeg areas with very poorly drained organic soils are located throughout the area and dominate the landscape of the higher elevation plateau.

Erosion is a natural force that occurs in every natural landscape. The landslide is the most severe type of erosion in the southeast Alaska. It generates most of the natural sedimentation in the area and is most common where unstable soil materials occur on steep slopes. Such areas are normally excluded from timber harvest activities. The locations of hazardous soils are displayed in Map 3-2 on the next page. The distribution of hazardous soils is shown in Table 3-3.

Table 3-3. Distribution of Soil Hazard Classes In the Frosty Area

Soil Erosion Hazard Class	Acres	Percent of Study Area
Low	8522	48%
Moderate	6424	36%
High	2744	16%
Total	17690	100%

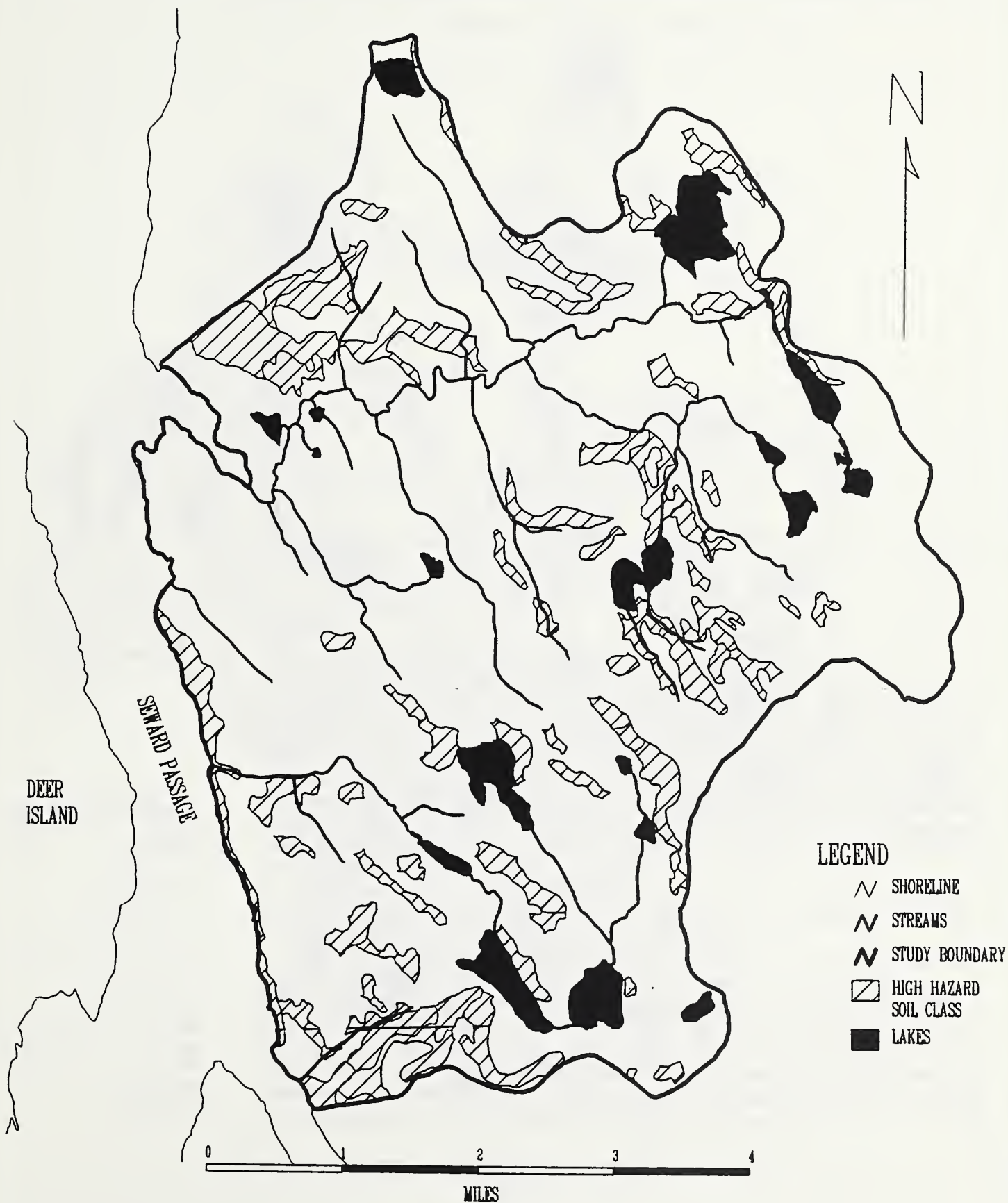
Wetlands and Floodplains

Like much of Southeast Alaska, the Frosty Study Area contains a large proportion of wetlands. Approximately 63 percent of the Frosty area is classified as wetland according to the soil resource inventory database (see Map 3-3). These wetlands are comprised mainly of muskegs and forested wetlands as well as smaller amounts of estuarine and alpine wetlands and small lakes and ponds (see Table 3-4 and Figure 3-1). Approximately 118 acres of floodplains have been identified as small, relatively narrow alluvial areas scattered along Frosty Creek and its lower tributaries. These areas are too small to show on the map.

Table 3-4. Types of Wetland

Wetland Type	Acres	Percent of Area
Muskeg	6100	34%
Estuarine	0	0%
Forested Wetland	3140	18%
Alpine Wetland	970	5%
Lakes and Ponds	980	5%
Total Wetlands	11190	62%

Map 3-2. Distribution of High Hazard Soils in the Frosty Study Area



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Map 3-3. Distribution of Wetland Types in the Frosty Study Area.

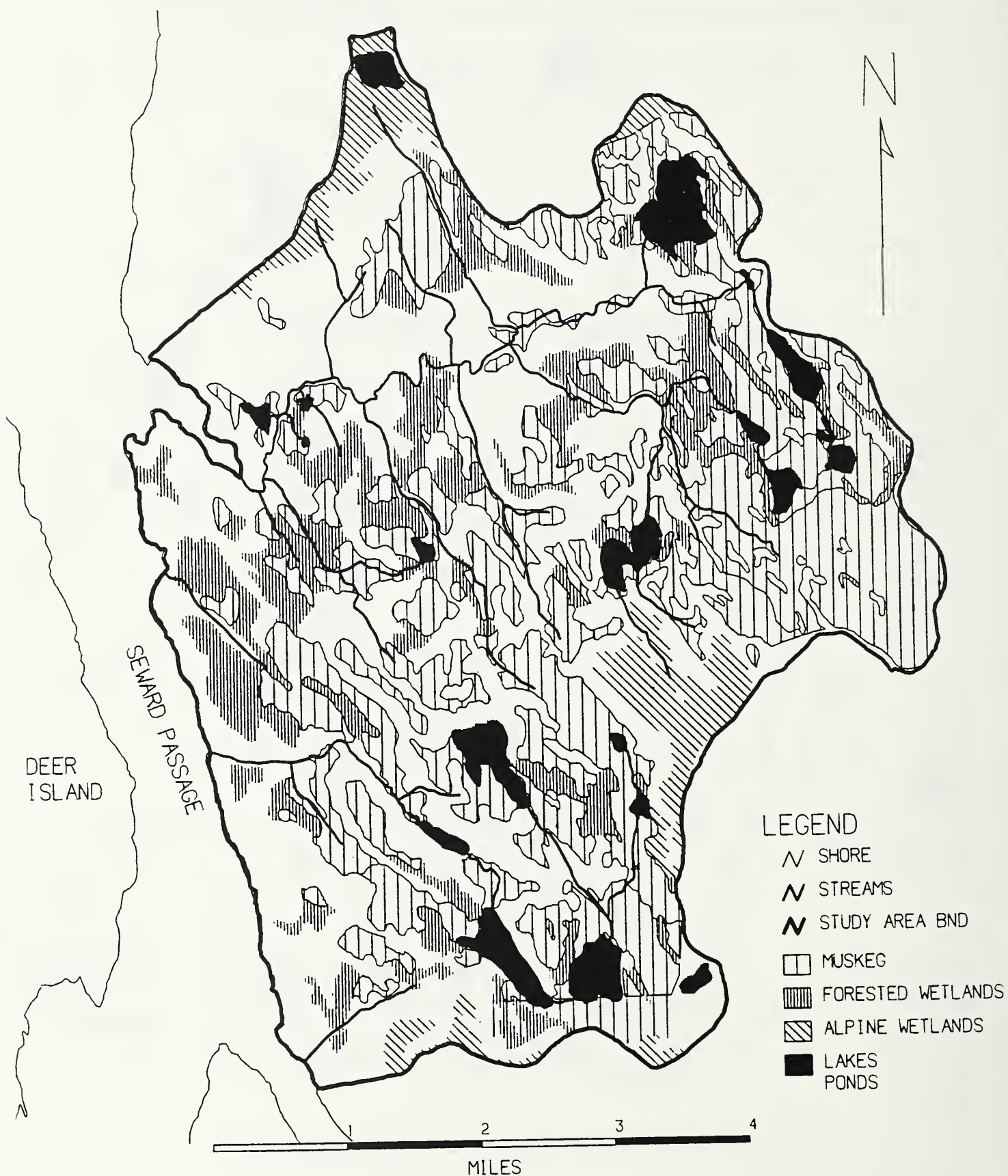
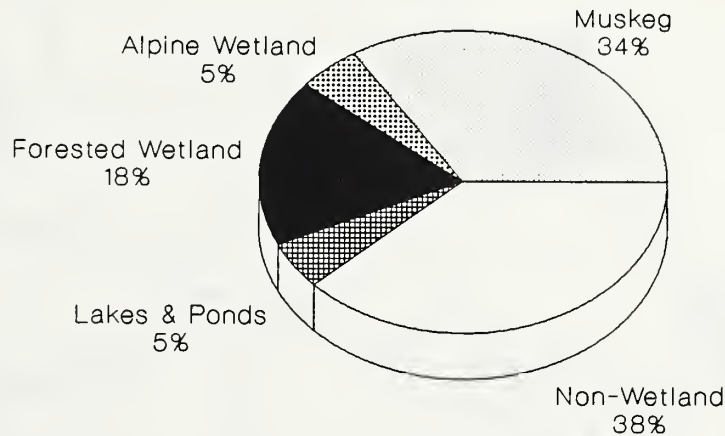


Figure 3-1. Proportion of Wetland Types.



Fish

For management purposes, streams are often classified into one of three categories of streams. Class 1 streams provide anadromous fish habitat; or could provide anadromous fish habitat if a structure allowed fish to pass over a migration barrier; or supports a population of resident trout considered important for sport fishing. Class 2 streams support resident fish populations only. These populations may have some sport fishing values and may contain catchable-sized fish. They generally occur upstream of migration barriers or steep gradient streams that preclude anadromous fish use. Class 3 streams have no fish populations, although they could affect downstream water quality and fish habitat. (Map 3-4 shows the class of each stream segment in the Frosty study area.)

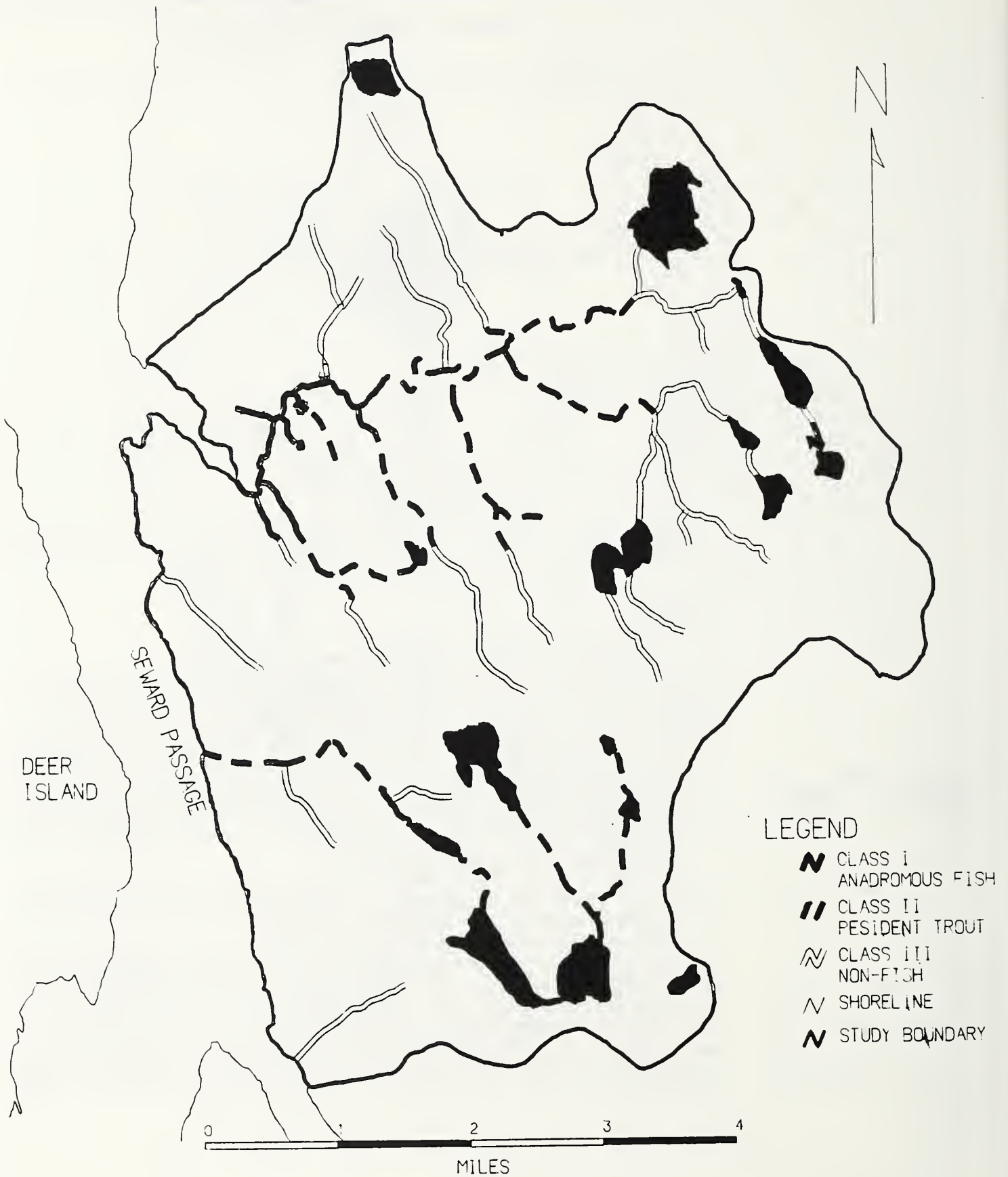


Pink salmon spawn in the lower $\frac{1}{4}$ mile of Frosty Creek. In recent years there have been very few counts in this stream in recent years, but average runs appear to be 500 to 1000 fish, with a range from 100 to 3000.

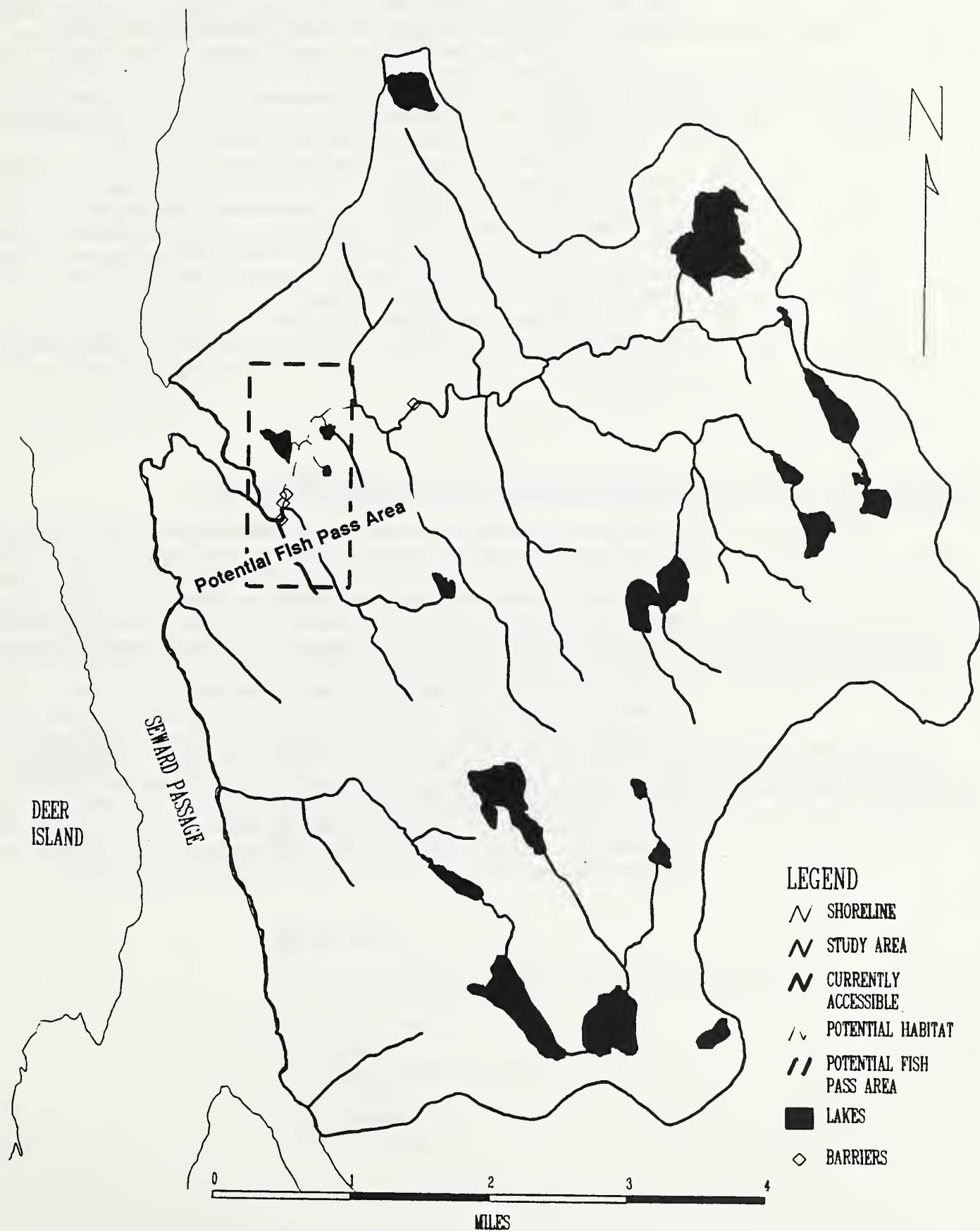
There are three barrier falls in Frosty Creek within the first $\frac{3}{8}$ mile (see Map 3-5). The first falls, $\frac{1}{4}$ mile from salt water, is a total barrier to pink and chum salmon and may also be a barrier to coho salmon and steelhead trout. No anadromous fish have ever been observed or captured above this falls. Approximately $\frac{1}{8}$ mile above this falls are two more vertical falls which are total barriers to all salmonids. Fish pass structures could allow upstream movement of fish over these vertical falls but not over a fourth barrier falls two miles upstream. The value of building fish passes will be analyzed if funding is available from timber sale receipts.

Chapter 3
Affected Environment

Map 3-4. Class of Stream Segments in the Frosty Study Area.



Map 3-5. Barrier Falls in Frosty Creek.



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Chapter 3

Affected Environment

There is a good population of cutthroat trout known to occur above and below these falls and they should also be present in suitable habitat in the major tributaries, lakes, and ponds. There is very little sport fishing in Frosty Creek at this time.

If coho salmon and steelhead trout could pass these first three falls, they could reach approximately six acres of stream rearing habitat and 26 acres of pond and small lake habitat. The additional habitat is capable of producing an estimated 3000 coho per year for the commercial fisheries or a comparable number of steelhead trout for sport fisheries, or some combination of both.

The lower reach of Frosty Creek is mostly bedrock-controlled and very stable. The middle reaches of mainstem Frosty Creek are moderately unstable and, for the most part, highly dependant on the streamside trees for channel stability and in-stream logs for fish habitat. Because of the low gradients and low flushing rates, these reaches of the creek are vulnerable to long-term degradation of salmonid spawning habitat and over-wintering habitat if sediment loads were significantly increased or if the amount of large woody debris was decreased.

Frosty Creek may be sensitive to changes in temperature because of its wide, slow-moving channel, and because of the presence of many muskegs and beaver ponds. However, fish kills related to temperature have not been documented in this drainage.

Wildlife Habitat Retention

The Forest Plan allows for the retention of Commercial Forest Lands (CFL) in their original state for several categories of old growth dependent species. Table 3-5 lists the percentage of CFL acreage to be retained for each category of habitat. These figures were calculated twice from the same habitat definitions, once in 1979 in the Forest Plan and again in 1988. The 1988 figures are used because they are considered to be more accurate. (Note that the old inventory suggests almost the entire study area provides habitat for eagles and that none of the area provides deer winter range, both of which are incorrect.) The location of habitat actually retained varies by alternative. See Map 4-2 in Chapter 4 for the areas retained in Alternative 3a.

It is anticipated that old growth management will change significantly in the Forest Plan Revision. Current direction in the Revision calls for the elimination of the categories and having a flat 24 percent retention of all Commercial Forest Land, both operable and inoperable. The new direction can't be implemented until the Revision is approved, but in anticipation that this will occur, a brief analysis was performed to identify implications for the Frosty study area. A total of 2300 acres would be retained following the new direction (see map in Appendix H).

Table 3-5. Acres of CFL Retained for Various Categories of Wildlife Habitat

Habitat Category		Acres Inventoried		% to be Retained In LUD 4	Acres to Retain Based on:	
Code	Description	Forest Plan	1988		Forest Plan Inventory	New Inventory
43	Bear Riparian	374	1174	10%	37	117
45	Deer Summer	7333	1195	5%	367	60
46	Deer Winter	0	3310	5%	0	165
49	Furbearers I	6660	3385	5%	333	169
50	Furbearers II	599	1120	10%	60	112
51	Landbirds	7483	4505	5%	374	225
52	Waterbirds	0	520	25%	0	130
56	Eagle Nests I	7483	728	15%	1122	109
58	Eagle Nests III	0	104	100%	0	104
Total (assuming no overlap)		--	--	--	2293	1191

Threatened and Endangered Species

There are two listed species that are known to occur in the general vicinity of the Frosty Study area, the humpback whale and the Northern (Stellar) sea lion.

Humpback Whale

The humpback whale is listed as endangered. There have been a few sightings of humpbacks in Ernest Sound but none in the immediate vicinity of Frosty Bay. There are no feeding areas or other critical habitat for humpbacks around Frosty Bay.

Northern (Stellar) Sea Lion

Northern (Stellar) sea lions were listed in June 1990 as a threatened species. There have been a few sightings of sea lions in the general vicinity of Frosty Bay. The closest documented haul-out is the southern tip of Deer Island, approximately 10 miles from Frosty Bay. There is no critical habitat for sea lions in the immediate vicinity of Frosty Bay.

Wildlife

The Frosty area supports a variety of wildlife common to Southeast Alaska, including:

- Sitka blacktail deer
- Marten
- Vancouver Canada goose
- Black bear
- Bald eagle
- *Mountain goat*

Chapter 3

Affected Environment

The first four are important species for commercial trapping, sport hunting, or subsistence use. They are indicator species for old growth habitat. Bald eagles are not considered endangered in Alaska, but because they are sensitive to forest management and are protected by Federal law, their nesting habitat is still protected. A small, local population of mountain goats occurs in the study area and could be susceptible to increased hunting pressure. Brown bear use the area only occasionally and are not discussed in this document.

The capability of the Frosty study area to support Sitka black-tail deer, pine marten, and black bear was analyzed with the use of habitat capability models developed for the Forest Plan revision. The models generate habitat suitability indices that indicate the relative quality of habitat for each species. The habitat suitability index (HSI) models generate a range of values from 0 to 1, with "0" having no value for a particular species and "1" indicating optimum habitat. A value of 0.25 indicates an area with the ability to support 25 percent of the animals that the very best habitat could support. Thus the number of animals the Frosty study area can currently support, without timber harvest, can be estimated by multiplying the HSI value times the number of animals an ideal habitat could support.

Sitka Blacktailed Deer

Sitka black-tail deer are common in southeast Alaska. During moderate to severe winters, they depend on high volume old-growth forest for survival. See Map 3-6 for location of deer winter range.

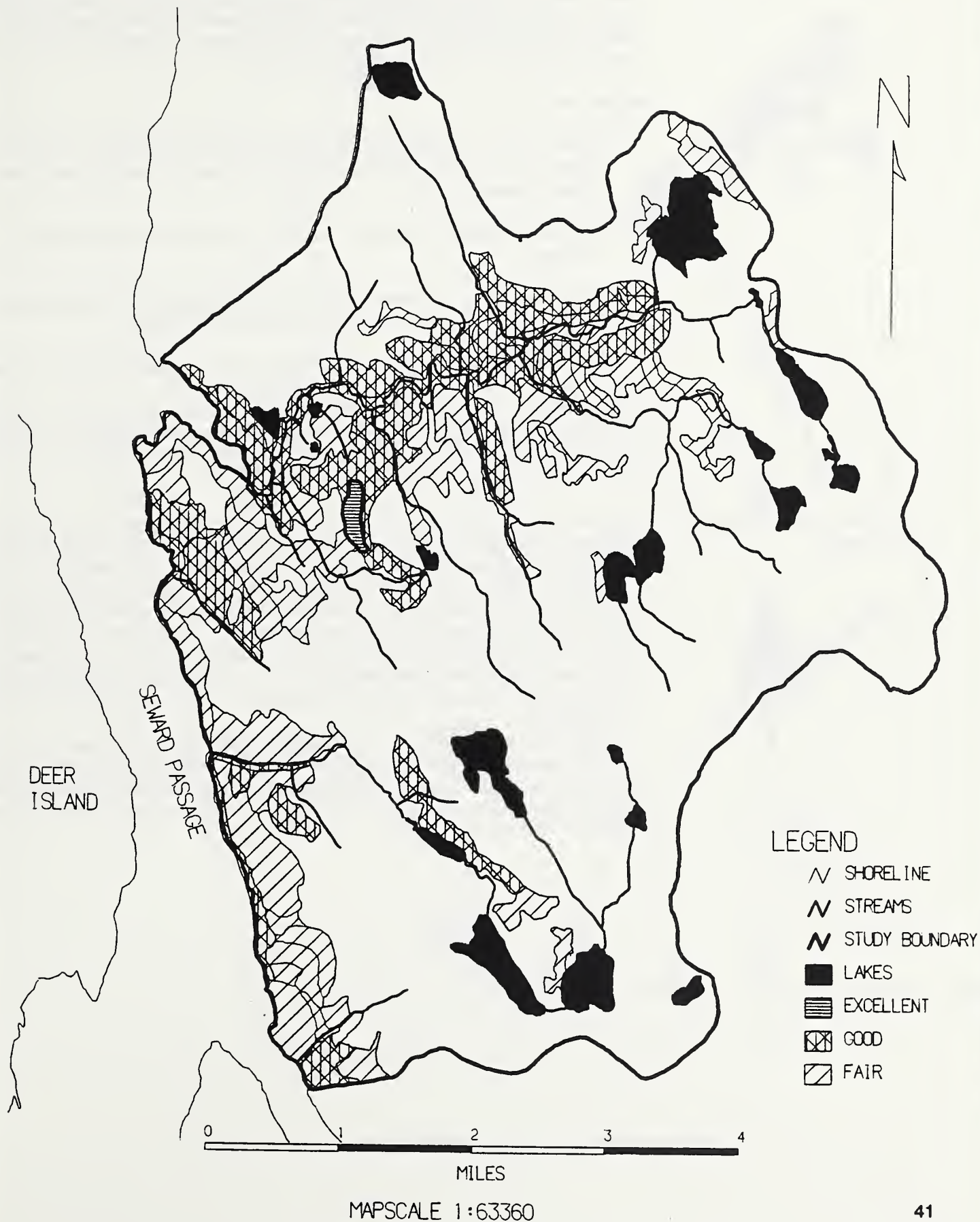
Model assumptions:

- Winter range is the limiting factor. It occurs below 1200 feet in elevation on north facing slopes and below 1500 feet on east, west, and south facing slopes.
- High volume class, southerly aspects, and low elevations have higher value to deer than low volume class, non-southerly aspects, and high altitudes.
Less snow accumulates in these areas, making it easier for deer to move around and forage more accessible.
- Optimum deer winter habitat can support 125 deer per square mile (640 acres) during a mild winter.



The HSI model assumes that an optimum winter habitat the size of the Frosty study area will support 2063 deer if there is no predation. *The Frosty area is not optimum. Much of the land is low in value as winter range due to the large percentage of muskeg and scrub timber that is of marginal value as winter habitat. Wolf predation is also thought to keep deer numbers low.* The model predicts that, under existing habitat conditions, the Frosty area can support up to 830 deer during a mild winter, 365 during a moderate winter, and 139 during a severe winter. The deer probably receive very little hunting pressure.

Map 3-6. Deer Winter Range



Chapter 3 Affected Environment

Pine Marten



Marten habitat is found along the beach and estuary fringes, in upland forest, and subalpine habitats. Snags and fallen trees provide dens for marten and cover for prey species (Pelikan and Vackar 1978, Spencer 1981). Approximately 12 marten are harvested from the Frosty area each winter, according to state hunting and trapping records over the past five years.

Model assumptions:

- Winter range is the limiting factor. Marten prefer high-volume, old-growth forests with many large fallen and standing snags with nearby small meadows close to water.
- Large openings are avoided by marten because of increased exposure to predators.
- Older second-growth stands (25-100 years) are avoided because these stands do not provide suitable prey or logs for denning.
- Optimum marten habitat the size of the Frosty area could support 73 marten.

There is little of the high-volume, old-growth habitat favored by marten in the Frosty study area. According to the model, the area is currently capable of supporting approximately 36 of the 73 marten that an optimum habitat could support because much of the land is low in value as marten habitat.

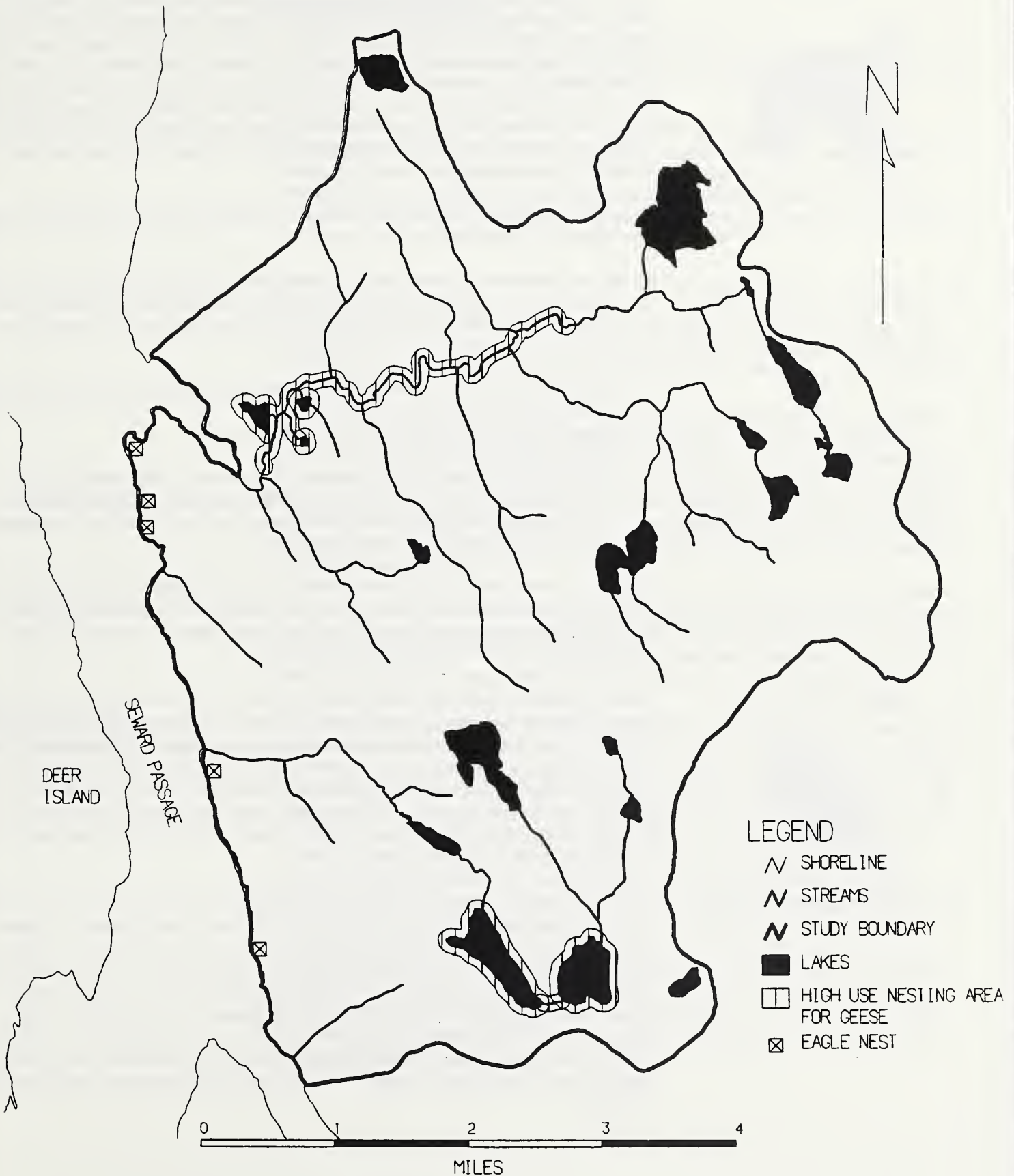
Vancouver Canada Goose



The Frosty study area contains one of three known high-density nesting sites for geese on the Wrangell Ranger District of the Tongass National Forest. Unlike other Canada geese which nest primarily in open wetlands, the geese in the Frosty area nest primarily in forested areas, near open water but occasionally as far as ½ mile away. Nests can be on the ground, on rootwads of wind-thrown trees, or on top of broken off snags. Most nests are found in or adjacent to old-growth timber from riparian spruce stands to scrub-muskeg shore pine. High density goose nesting areas are shown on Map 3-7. *The 1990 goose study team estimates that there are 5-10 breeding pairs of geese in the study area, and 40-60 moulting non-breeders.*

Within the study area, adults and goslings feed in heavy timber, around the edges of muskegs, and along the edges of ponds, lakes, and streams. They feed on skunk cabbage, blueberry (*Vaccinium* sp.), grass, and other forbs. Goslings flee into heavy timber and brush when threatened by predators and are usually not found far from cover.

Map 3-7. Goose and Eagle Habitat



Chapter 3 Affected Environment

Black Bear



The Frosty study area supports a moderate population of black bears. The HSI model indicates it can support 32 black bears at this time. This is 63 percent of the number of bears an optimum habitat of the same size could support. Limiting factors in the area include the lack of a major salmon run, low blueberry production, and lack of major estuarine or tidal grassflats. There is a fair amount of grass and skunk cabbage around the inland lakes and streams which compensate for the lack of beach grass to some extent. Grass and skunk cabbage roots are important bear foods in the spring. There is a small salmon run in the lower ¼ mile of Frosty Creek and a few bears (both black and brown) have been observed feeding on these fish. Key factors used in the model are:

- The presence of high-volume, old-growth timber which provides large hollow logs and trees for denning.
- The presence of openings such as avalanche slopes and young (5-20 year old) clearcuts which provide blueberries and salmonberries. These openings need to be small to be fully utilized, since bears tend not to move far from cover.
- The presence of grassflats, either tidal/estuarine, or inland at low elevations.
- The presence and relative extent of salmon runs.
- The extent of plant associations which produce skunk cabbage and blueberries. Good skunk cabbage sites are generally open-canopied and poorly drained. Good blueberry producing sites tend to be low to moderate volume timber stands and subalpine zones.

One or two brown or black bears are seen each spring feeding along the shore of Frosty Bay. Forest Service personnel have observed a few black bears inland in the study area. It is possible that some of these same bears travel to Anan Creek to feed on the large pink salmon run there.

Bald Eagle



Bald eagles nest almost exclusively within 500 feet of the beach in large, old-growth trees capable of supporting nests which may be up to ten feet in diameter. Eagles perch in large trees and snags located along beaches, major streams, and estuaries.

There are five known bald eagle nest sites in the study area and three are near proposed harvest areas and will require protection measures (see Map 3-7). None of the nests were active in 1989. A sixth nest was reported on the west shore of Frosty Bay approximately one mile south of the tip of the peninsula, but the sighting could not be confirmed.

Mountain Goat

A small population of goats inhabits the ridge system to the north of Frosty Creek. The south tip of this ridge system is in the study area. This population of goats is isolated from the much larger population to the east in the vicinity of Boulder Lake. Due to the sedentary nature of goats, it is doubtful there is much interchange between these two populations, or that the Boulder Lake herd uses the study area. A very small percentage of the wintering habitat of the population to the north occurs in the study area. It is not known how many goats are in this herd or how many use the study area to winter. A total of 4 goats were seen using the bluffs to the north of Frosty Creek by Forest Service field crews in the early spring of 1990.

Subsistence

Congress recognized the importance of subsistence use of resources to the rural communities of Alaska with the passage of the Alaska National Interest Lands Conservation Act (ANILCA). ANILCA defines subsistence as:

The customary and traditional uses by rural Alaska residents of wild, renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of nonedible byproducts of fish and wildlife resources taken for personal or family consumption; for barter, or sharing for personal and family consumption; and for customary trade (ANILCA, 16 USC 3113).

Mean income is an indicator of the importance of subsistence to a community. A household with a higher income would be able to supply more of its needs through the cash economy. However, a higher income does not always indicate a lesser dependence on subsistence resources. For example, people who earn higher incomes may give the resources they harvest to others who are unable to harvest their own.

Even if a household can purchase all of its food needs through the cash economy, the act of gathering subsistence resources is an important cultural aspect in southeast Alaska communities. For example, traditional foods may not be available through any means other than subsistence gathering. The occasions for gathering wild foods are often social events. Historical patterns of movement, such as the annual cycle of dispersal into small family groups at summer fishing camps to larger gatherings at potential winter villages are also linked to the tradition of subsistence harvest.

The following information is based on the Wrangell Harvest Study (Cohen 1989), the Tongass Resource Use Cooperative Survey (TRUCS 1988), and harvest records prepared by the Alaska Department of Fish and Game (ADFG 1988). The studies do not distinguish between subsistence use and sport use, nor do they describe frequency of use, success rates, or details on the number of users.

Subsistence Communities

Of 31 subsistence communities in southeast Alaska, Wrangell is the only community that shows documented use of the fish and game in the Frosty study area. Wrangell is located approximately 40 miles north of the Frosty study area, on the northern tip of Wrangell Island, about seven miles from the mouth of the Stikine River. The 1985 population of 2836 was almost 40 percent Alaska Native. The major source of employment include government (25 percent), retail trade (19 percent), manufacturing (16 percent), and fishing and fish processing (13 percent). Employment in the tourism, retail, and fishing sectors is seasonal. Per capita income in Wrangell during 1987 was \$11,989 according to the 1989 Supplemental EIS for the Alaska Pulp Corporation 1981-86 and 1986-90 operating periods.

Wild game and fish provide 23 percent of the household food supply for Wrangell residents. Wrangell residents hunt deer, moose, bear, and waterfowl; fish for salmon, halibut, and other marine fish; and gather shellfish and berries. The annual harvest of subsistence resources was about 165 pounds per person in 1987, including shellfish (25 percent), salmon (18 percent), and other finfish (26 percent).

Chapter 3 Affected Environment

Use of Frosty Area

The Wrangell Harvest Study indicates the use of deer, seals, gamebirds, salmon, and non-salmon finfish in or near the Frosty study area. In addition, the TRUCS data indicates the use of marine mammals in and around Frosty Bay.

Each of the species described was sought by 1-10 percent of Wrangell households. This could mean as little as one unsuccessful attempt by one household in a 50 year period, or it could mean successful attempts by 100 households every year. The Forest Service used additional information to identify whether the amount of use was significant, and whether the use was subsistence use or sport use. All game and fish harvested in the Frosty study area requires a sport hunting and/or fishing license.

***Deer**

According to TRUCS maps, the Frosty area is not often hunted for deer, nor is it considered a reliable place to hunt. No deer were reported harvested in the area (ADFG minor harvest unit 1816) in 1987 or 1988, nor are any hunters or hunter days documented.*

***Moose**

Cohen refers exclusively to "... a small, isolated, but healthy moose population along the lower Stikine River," outside the Frosty study area. ADFG data was not specific to the Frosty area.*

***Black and Brown Bear**

A few bears, both brown and black, have been seen in Frosty Bay by Forest Service personnel and Wrangell area residents. One bear hunter described that on her trips she didn't specifically go to Frosty Bay. Instead, it was one of several bays her group cruised looking for bears. She said it is not as good an area as other nearby bays and inlets for bear hunting. No black or brown bear were harvested in the study area between 1981 and 1987 according to ADFG harvest data.*

***Mountain Goat**

Goats are generally hunted for sport use and are not considered a subsistence species. Most goat harvest in the area is to the east, in the vicinity of Boulder and Eagle Lakes. Between 1981 and 1987, four goats were harvested according to ADFG harvest data.*

***Gamebirds**

Gamebirds, primarily waterfowl are hunted within Frosty Bay and along the shore within a mile of Frosty Bay. The harvest is minimal because there are much more productive areas nearby. Harvest of waterfowl was not listed by minor harvest area or game management unit in the ADFG data. In addition to a sport hunting license, waterfowl hunting requires State and Federal waterfowl stamps and is therefore considered sport use rather than subsistence use. No waterfowl subsistence harvest has ever been authorized in southeast Alaska.*

***Salmon and Non-salmon Finfish**

Both categories are sought offshore of the entire Frosty study area. None of this use occurs in the Frosty study area itself. Very few if any of the salmon and steelhead caught adjacent to the study area are produced in Frosty Creek. Most fishing within the bay is by people anchoring for the night or to wait out a storm. Sport fishing for king salmon, pink salmon, and coho salmon occurs to the north, in the vicinity of Point Warde and Anan Bay.*

Chapter 3 Affected Environment

***Seals, Marine Mammals**

Only Alaska Natives are allowed to harvest marine mammals. As a result, any harvest is considered subsistence use. Marine mammals may be sought within Frosty Bay and along the shore within a mile of Frosty Bay. Current harvest levels are thought to be low within Frosty Bay.*

***Invertebrates (Crab, Shrimp, etc.)**

There are informal, undocumented reports of shrimp and dungeness crab harvest in Frosty Bay, for personal use.*

Extent and Type of Use

The Frosty IDT found little evidence of sport or subsistence use of fish or wildlife in the Frosty study area and there is no indication that the use is customary or traditional subsistence use.

Hunting and Trapping

Wildlife in the study area is managed by the Alaska Department of Fish and Game (ADFG). Hunting is allowed during open seasons on black and brown bear, Sitka blacktail deer, moose, and mountain goat. Although a limited amount of hunting takes place for all these species, the study area is not known locally as "the place to go" for hunting success.

The trapping of furbearers, mostly mink, marten, and wolf, occurs along the saltwater beach fringe and along the creeks. State hunting and trapping records indicate that an average of 12 marten are taken from the study area each year for commercial purposes.

Recreation

Historically, most users of the study area have been residents of Wrangell, Thoms Place, Myers Chuck, and Ketchikan. The most significant use of the area is the anchorage in Frosty Bay, which provides protection from storms for both commercial and recreational vessels.

Use of the area is estimated to be light (less than 100 recreation visitor Days per year) because it is distant from population centers, and because the character of the area is overshadowed by the presence of more attractive areas, including Anan Creek and Point Warde to the north and Santa Anna Inlet to the south.

Most uses occur in saltwater, along the beach, and for a short distance up Frosty Creek. There is also some recreation associated with inland lakes for fishing but use of the uplands is light.

There are no recreation facilities in the study area. The nearest recreation development is a cabin and a bear and salmon observatory on Anan Creek. Nearby Santa Anna Inlet is visited by small cruise ships during the summer months. These vessels are likely to use Seward Passage and travel past Frosty Bay on the way to Anan or Zimovia Strait.

The Frosty area is currently unroaded and therefore provides recreation opportunity values for solitude. Although there are no roads or trails to the larger lakes within the area, some are accessible by floatplane.

Wild and Scenic Rivers

Wild and Scenic Rivers Act

The Wild and Scenic Rivers Act requires that all federal land management agencies identify rivers with outstandingly remarkable features and decide which will be recommended to Congress for designation as Wild and Scenic Rivers. Designation is a four step process: (1) the agency identifies streams with outstandingly remarkable features; (2) the agency classifies each eligible stream into one of three categories, wild, scenic, or recreational; (3) the agency evaluates the impacts of designating each eligible river and selects the rivers that are suitable for recommendation to Congress; and (4) Congress designates rivers Wild and Scenic.

Tongass Forest Plan Revision

The Tongass National Forest identified rivers eligible for designation during the spring of 1990 and classified them as wild, scenic, or recreational. The eligible rivers will be examined for suitability in the Forest Plan Revision process. Each Revision alternative includes a different mix of river segments that will become suitable if that alternative is selected. The analysis evaluates the gains or losses to all resources if Congress were to designate the river Wild and Scenic. Each alternative also includes interim management prescriptions for each suitable river to protect the outstandingly remarkable values until designation occurs. The rivers in the selected alternative are then recommended to Congress for designation.

Frosty Study Area

None of the streams in the Frosty study area were identified as eligible for Wild and Scenic designation. No outstandingly remarkable features were discovered and no further analysis has been performed.

Cultural Resources

A literature search has revealed little cultural data concerning the Frosty Bay area. Goldschmidt and Haas (1946) note the presence of several seasonal camps and dwellings in the Frosty Bay area. Frosty Bay has been specifically noted as having been used for fishing and trapping.

Since 1983, several limited ground surveys have been conducted in the general area. These surveys have been documented and the information reported to the State Historic Preservation Officer. The Frosty Bay area has a high incidence of axe-cut, notched, and stripped cedar. Two historical archaeological sites are recorded within the Frosty VCU. It is also known that a number of historic fishing sites exist in the general vicinity on the Cleveland Peninsula. It is quite probably that future surveys conducted in conjunction with site-specific projects may locate additional sites.

Protection and/or mitigation of cultural resources situated on Federal lands is required by various Federal laws and regulations including the Antiquities Act of 1906, the National Historic Preservation Act of 1966, Executive Order 11593, and the Archeological resources Protection Act of 1979.

Visual Resource

The Frosty area is part of the Coastal Range landscape character type, characterized by rocky, high-elevation mountains, deep valleys, glaciers, ice fields, large rivers, and deep fiords (*Visual Character Types*, R10-63, May 1979). The landscape in the study area is rated Variety Class C, indicating a low level of landscape diversity for the Coastal Range character type. The terrain adjacent to the mouth and headwaters of Frosty Bay rises gradually from saltwater. South of Frosty Bay the terrain becomes steep and uniformly timbered near saltwater. Inland, the topography is irregular and hummocky, and muskegs are interspersed with steep timbered hillsides. Numerous lakes are present. Frosty Bay and the small coves adjacent to Seward Passage add interest to the area seen from saltwater. Second growth stands are apparent near the mouth of Frosty Bay.

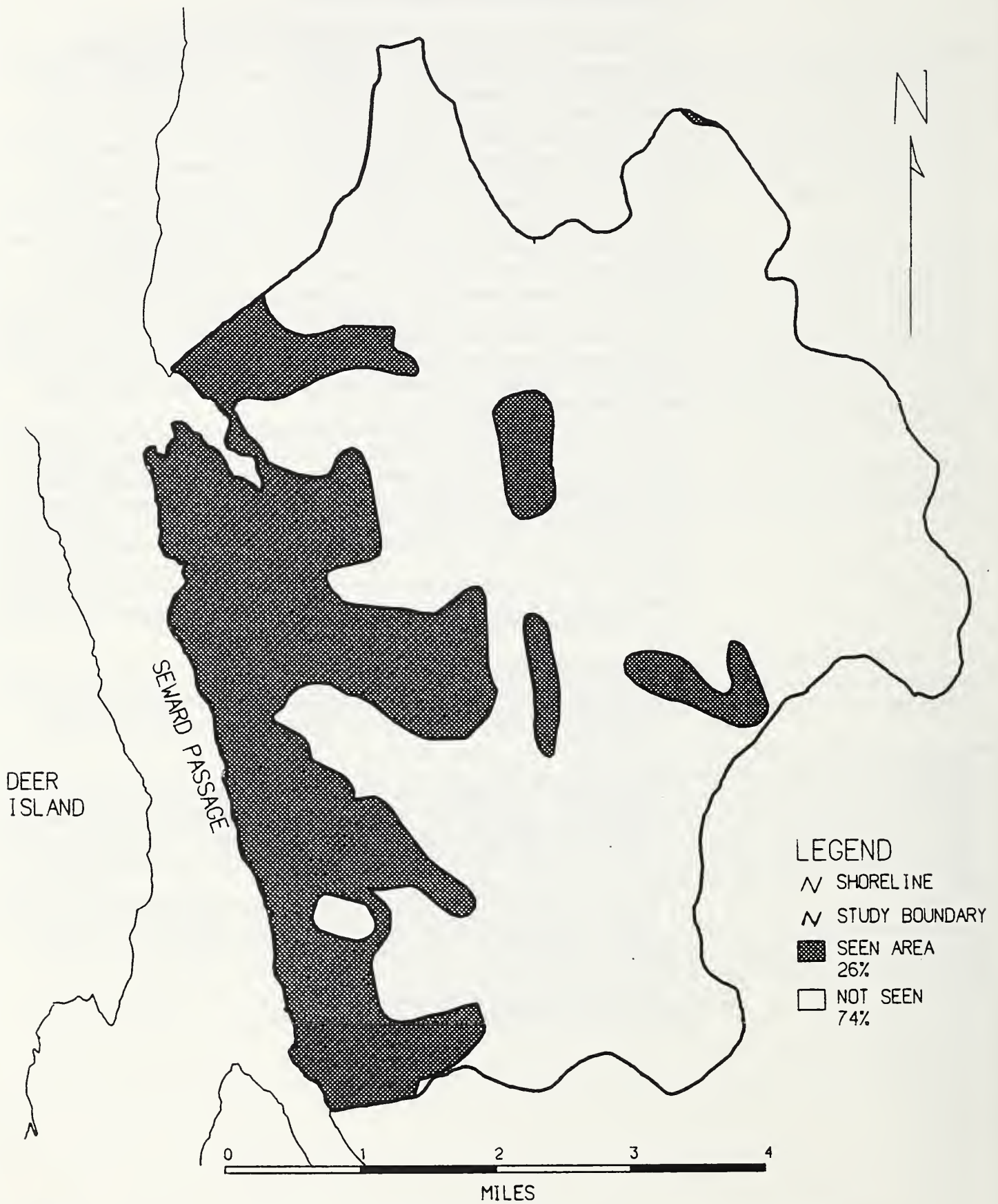
Approximately 74 percent of the Frosty area is not seen from a sensitive travel route. The remaining 26 percent is viewed from Seward Passage and Frosty Bay, moderately sensitive travel routes (see Map 3-8). Sensitivity levels are a measure of viewer interest in the scenic qualities of the landscape along a particular travel route. Seward Passage and Frosty Bay receive use by commercial fishing vessels and small recreational boats. Seward Passage is occasionally used by cruise vessels and is an alternative ferry route.

Visual Quality Objectives (VQOs) are standards for visual quality that reflect the varying degrees to which a landscape may be modified. The standards are based on the character of the natural landscape and public concern for scenic quality. For example, in areas of high scenic quality and high viewer interest, an inventory VQO of "Retention" would suggest managing for little or no visible change in the landscape. "Inventory" VQOs are objectives reflecting the visual resource concerns in a given area. However, they may or may not be met by the alternative selected. Selection of the alternative would include the decision of whether or not to meet inventory VQOs. Inventory VQOs for the Frosty area include the following categories shown in Map 3-9:

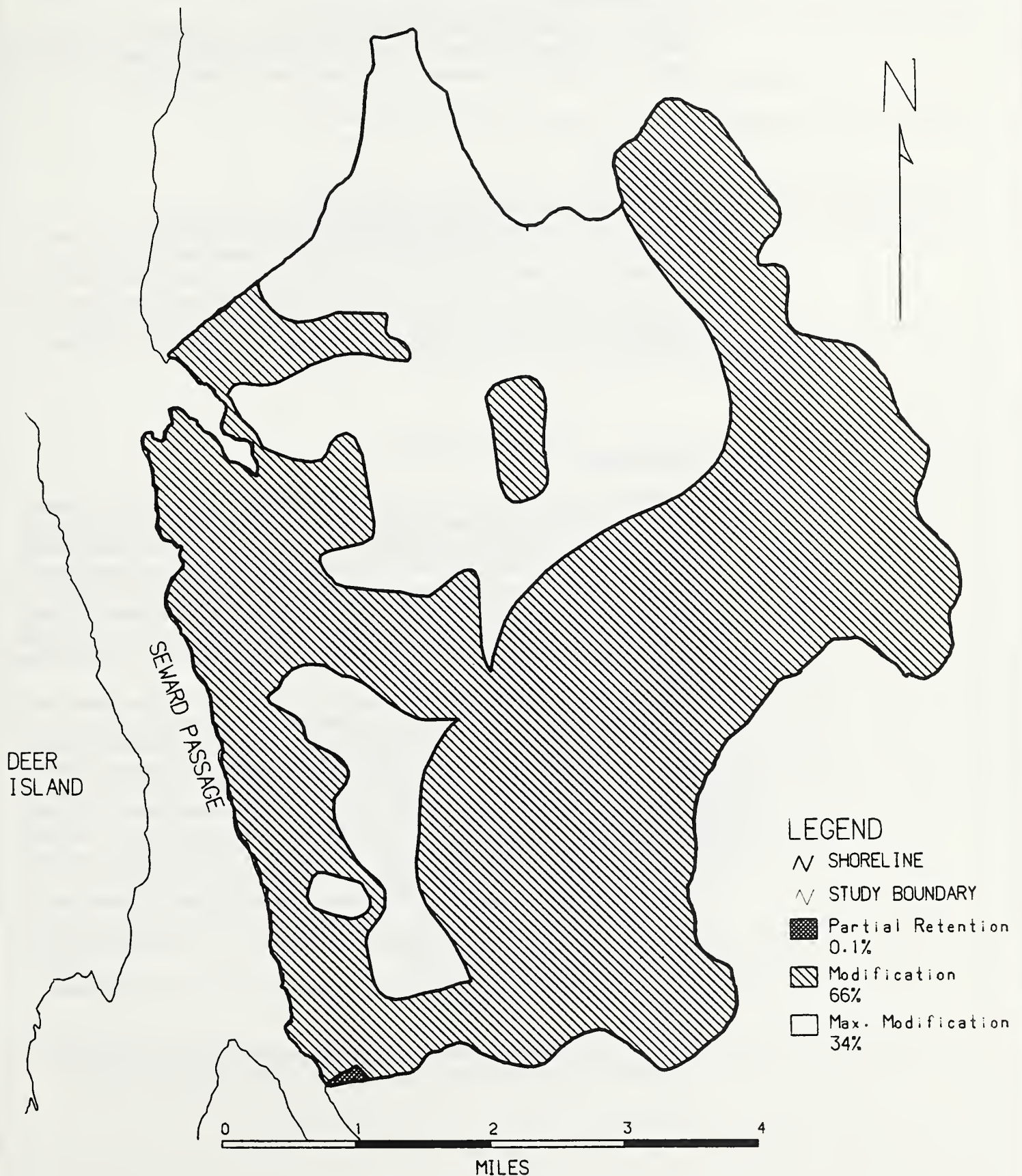
- *Modification and Maximum Modification* in areas not normally seen. In areas of Maximum Modification, "man's activity may dominate the characteristic landscape but should appear as a natural occurrence when viewed as background."¹
- *Modification* in the areas seen from sensitive travel routes. In areas of Modification, "man's activity may dominate the characteristic landscape but must utilize naturally established form, line, color, and texture. It should appear as a natural occurrence when viewed in the foreground or middleground."¹
- *Partial Retention* in small portions of the seen area not affected by the proposed sale. In areas of Partial Retention, "man's activity may be evident but must remain visually subordinate to the characteristic landscape."¹

¹ National Forest Landscape Management, Volume 2.

Map 3-8. Seen and Non Seen Area Within the Frosty Study Area



Map 3-9. Visual Quality Objectives in the Frosty Study Area



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Minerals

The Bureau of Land Management (BLM) Activity Report, dated October 3 1988, indicates no mineral claims within the study area. It is possible that some prospecting is taking place and that more prospecting might occur if roads are built.

Lands

All lands within the study area are National Forest System Lands. No special uses have been authorized by permit. No encumbrances are known to exist. The State of Alaska has started the process to select 4090 acres near the Tyee Lake Hydroelectric Plant for development of a new community and a deep-water port. The land selection is located at the head of Bradfield Canal, approximately 20 miles east of the study area. Such development could generate an increase in recreation use, not only in the Bradfield Canal area, but in the Frosty Bay area as well.

Timber

The Frosty area contains uneven-aged stands of western and mountain hemlock, Sitka spruce, Alaska yellow-cedar, and western redcedar. The species composition varies by site. Sitka spruce and mixed hemlock-spruce stands occur on the lower slopes and in stream bottoms. Western redcedar is usually found at lower elevations and along the shoreline. Yellow-cedar is found at higher elevations and at wetter sites at low elevations. Some mountain hemlock also grows in the area. The upper elevations are interspersed with commercial forest stands, scrub timber, and muskeg. There are no known threatened, endangered, or sensitive plants in the Frosty study area.

Dead and dying tree crowns and snags are common within the old-growth stands. Many of the trees are decaying and have already lost a significant portion of their volume to rot. Dwarf mistletoe, which can retard growth in heavily infected hemlocks, is heavy in the stands around Frosty Bay, but is moderate to non-existent as one moves inland. Alaska Cedar Decline is a phenomenon that results in dead Alaska yellow cedar trees not only in this area but throughout southeast Alaska. The affected areas are generally around edges of muskegs and the transitional zones between the muskegs and the higher-volume stands. The cause of this decline is not known.

There has been no extensive timber harvest within the study area other than selection of individual trees that were accessible from the water. However, two second-growth stands are located near the mouth of Frosty Bay. They were harvested in 1943 (27 acres) and 1917 (73 acres). The remaining 10,071 forested acres are classified as old-growth forest.

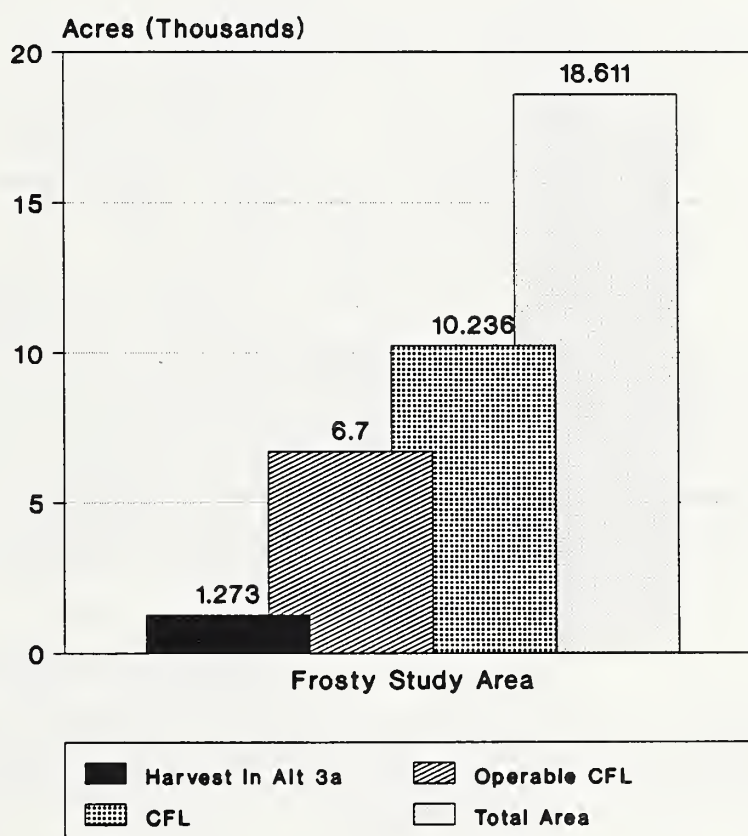
For timber purposes, forested land is generally divided into the following categories:

- Commercial Forest Land (CFL) is land that can produce at least 8000 board feet of timber per acre in 100 years and includes timber on high-hazard soils.

- Non-CFL includes muskeg, rock surfaces, and sparsely stocked, poor timber-growing sites.
- Operable CFL can be reached with known harvest systems.
- Inoperable CFL cannot be harvested with any logging system, or is not planned for harvest in this Final EIS due to high-hazard soils.

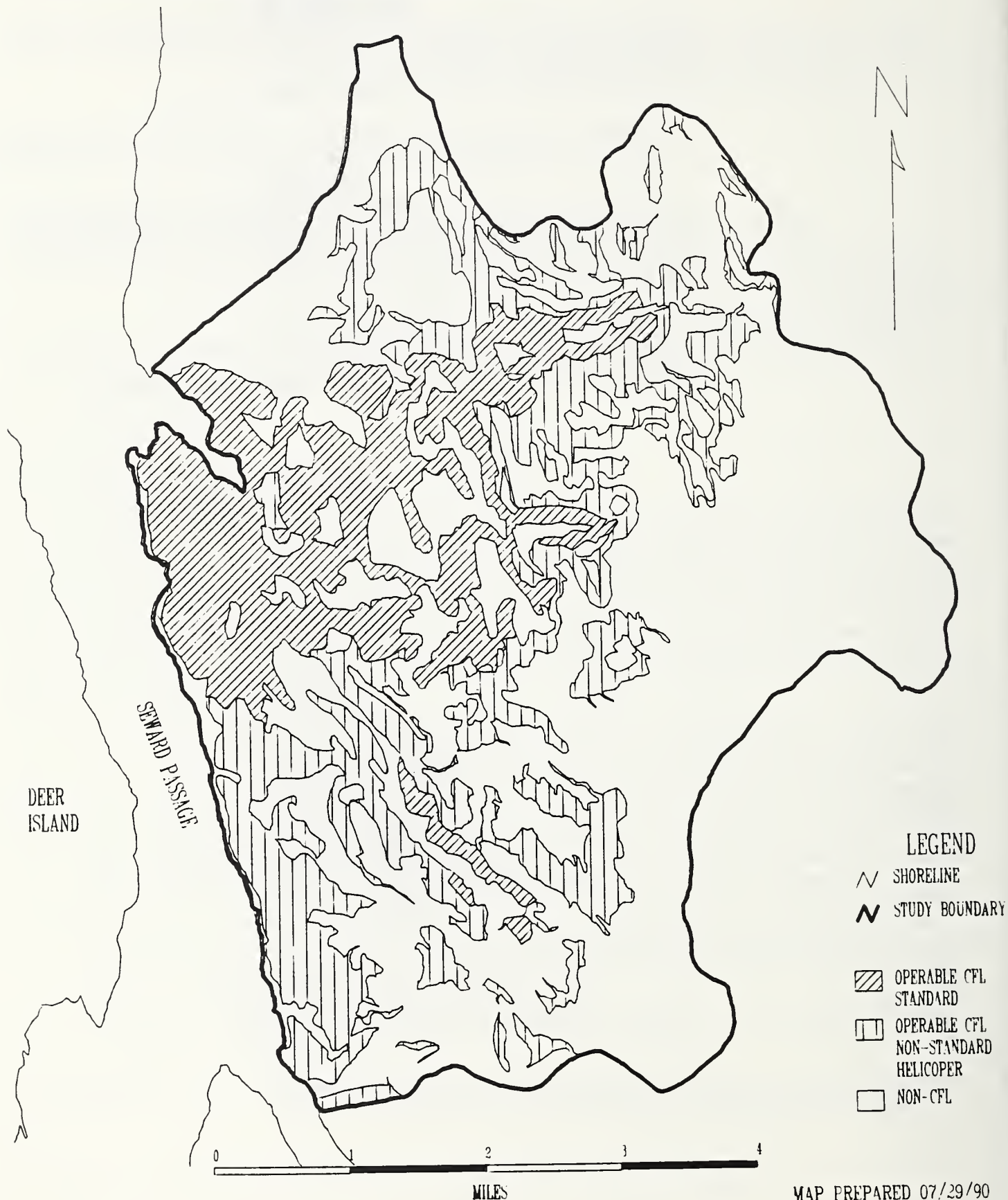
Map 3-10 shows where the operable CFL is located in the Frosty area. Of the 18611 acres in the Frosty area, 55 percent is considered commercial forest land (see Figure 3-2.). The operable CFL comprises 66 percent of the CFL and 36 percent of the total landbase in the Frosty area.

Figure 3-2. Proportion of Frosty Study Area that Is Operable CFL



Chapter 3
Affected Environment

Map 3-10. Operable, Commercial Forest Land



MAP PREPARED 07/29/90

By i jeffries

Chapter 3 Affected Environment

CFL is often described in terms of the volume of timber on each acre. Volume is a measure of number and size of trees, expressed in board feet. Fifty-three percent of the operable commercial forest land in the Frosty area occurs in volume class 4, with 8,000 to 20,000 board feet of timber per acre (see Table 3-6). Thirty-six percent occurs in stands of 20,000 to 30,000 board feet per acre, and only 11 percent occurs in high-volume stands between 30-50,000 board feet per acre. Volume classes of 4 or higher are considered high enough in timber value to harvest. Less than one percent of the operable CFL occurs in stands with less than 8,000 board feet per acre. These include the harvested stands mentioned previously and neither area yet contains enough volume to warrant harvest.

Table 3-6. Acreage by Volume Class

VOLUME CLASS	Board Feet Per Acre	COMMERCIAL FOREST LAND Acres (%)	OPERABLE CFL Acres (%)
3	< 8,000	96 (1)	96 (1)
4	8-20,000	5478 (55)	4040 (54)
5	20-30,000	3350 (34)	2523 (40)
6	30-50,000	958 (10)	772 (10)
7	50,000+	0 (0)	0 (0)
All Classes		9882 (100%)	7431 (100%)

Employment

The timber and fishing industries provide the majority of all jobs in the primary employment sector in southeast Alaska. In Wrangell, timber harvest and milling are the primary employers followed by Federal, State, and local government, and seafood harvesting and processing. The Wrangell Forest Products sawmill is the town's largest employer and tourism is an emerging industry. Ketchikan is the State's fourth largest city. Its economy is based on timber, fishing, and tourism. In Myers Chuck, most of the residents fish for a living. Thoms Place is a small settlement that is also dependent on fishing.

Transportation

This area is currently unroaded and there are no developed or maintained trails. The proposed road system is not designed to interconnect with any other road system on the Cleveland Peninsula, nor is it expected to connect in the foreseeable future.

Other Planned or Proposed Activities In Surrounding Area

A number of projects are proposed or in process on surrounding National Forest System lands. Although the projects are not related to the Frosty Timber Sale, they could affect the Frosty area in the future.

Power Corridor

A utility corridor through the Frosty area has been proposed in one of the alternatives of a Draft EIS written by the Ketchikan Area of the Tongass National Forest. The EIS examined the possibility of an electric power transmission intertie for Southeast Alaska. No road linkages were proposed in the Frosty area, however, the corridor could have additional impact on the scenic quality of the area.

Deer Island Timber Sale

In November 1985, a timber sale was sold on Deer Island, located across Seward Passage from the Frosty area. The sale scheduled a harvest of 14.8 MMBF of timber from 466 acres. Harvest activities were completed in May 1990. The purchaser used helicopters to yard this sale. Harvest units on Deer Island are visible from Seward Passage, as would harvest units from the Frosty timber sale.

Bradfield River Road

A joint Federal/State/Private task force is evaluating the possibility of a road corridor from the Bradfield Canal to Johnny Mountain Mine, British Columbia, with an eventual connection to the Cassiar Highway in British Columbia, approximately 40 miles away. More recently, the State of Alaska has funded an economic feasibility study of a road along this corridor and alternative routes. Recreational use of the Frosty area could increase if a road connection were made and if the population increased at the head of the Bradfield Canal.

Forest Plan Revision

The Tongass National Forest Land Management Plan (the Forest Plan) is being revised. As part of the revision process, changes in management direction for the Frosty Study Area will be considered. Even so, management activities will continue under the direction of the current plan until the revision process is completed. The proposed timber sale is consistent with the current plan direction and is scheduled to be sold prior to the completion of the revised plan.

Introduction

The purpose of this chapter is to describe the physical, biological, economic, and social effects likely to result from putting each of the alternatives into effect. A summary of the consequences of each alternative is displayed in *Table 2-1 in Chapter 2.* The information has been taken from more detailed reports that are available for public review in the planning record, located at the Wrangell Ranger District, Wrangell, Alaska.

Adverse Environmental Effects Which Cannot Be Avoided

There are some adverse effects which cannot be avoided if one of the action alternatives is selected.

Harvest in the Frosty area would reduce the number of old-growth stands. *As a result, the carrying capacity of the habitat will be reduced for old-growth dependent species.*

Ground disturbing activities such as stream crossings and culvert installation will temporarily increase silt loads in Frosty Creek and its tributaries. In addition, a small loss of fish habitat will occur at road crossings and in those portions of fish habitat occupied by culverts.

Timber harvest and road construction will change the appearance of the landscape. The area where change will be most noticeable is from Seward Passage near the mouth of Frosty Bay and in Frosty Bay itself. The effects will diminish when the vegetation grows back.



Short-Term Use Versus Long-Term Productivity

One of the major benefits of timber harvest is the increased growth rate of the new trees (regeneration). In old growth climax stands, annual growth is offset by mortality so that net growth is zero (Hutchison and Labau 1975). In contrast, young-growth stands will produce, on a 100-year rotation on an average site, about double the cubic foot volume maintained in most old-growth stands (Taylor 1934). Each action alternative would improve the production of merchantable timber by converting old-growth climax stands to highly-productive, even-aged, young-growth stands. In addition, production of merchantable wood can be further increased if, after the site is harvested and regenerated, the new stands are precommercially thinned.



Irreversible Loss of Resources

An irreversible loss is a permanent or long-term use of a resource that is not replaceable within a lifetime, including the destruction of a cultural site or consumptive use of minerals. In the Frosty study area, for example, cultural artifacts and cultural sites could be irreversibly disturbed as a result of the timber sale. Subsurface cultural sites that cannot be located with surface surveys are especially vulnerable. The harvest of old-growth timber in the Frosty area is also an irreversible loss because the stands may take *200 to 300 years* to develop and the commitment of this resource to timber harvest is reversible only over a long period of time.

Chapter 4

Environmental Consequences

Irretrievable Commitment of Resources

An irretrievable commitment is a decision that makes other choices unavailable during the life of the commitment. The decision cannot be retrieved for the time that has already passed, but could be changed in the future.

Timber harvest and road construction would irretrievably remove the opportunity to use those parts of the Frosty area for primitive, unroaded recreation until the vegetation grows back. The construction of roads and the establishment of rock pits is also considered an irretrievable commitment that would reduce or eliminate soil productivity on those sites unless they are rehabilitated. The establishment of buffer strips around eagle nest trees, around cultural sites, and within Aquatic Habitat Management Units (AHMUs) makes these buffer areas unavailable for timber harvest.

Watershed

The impacts of a timber sale on water quality and quantity in the Frosty area are measured with a number of factors:

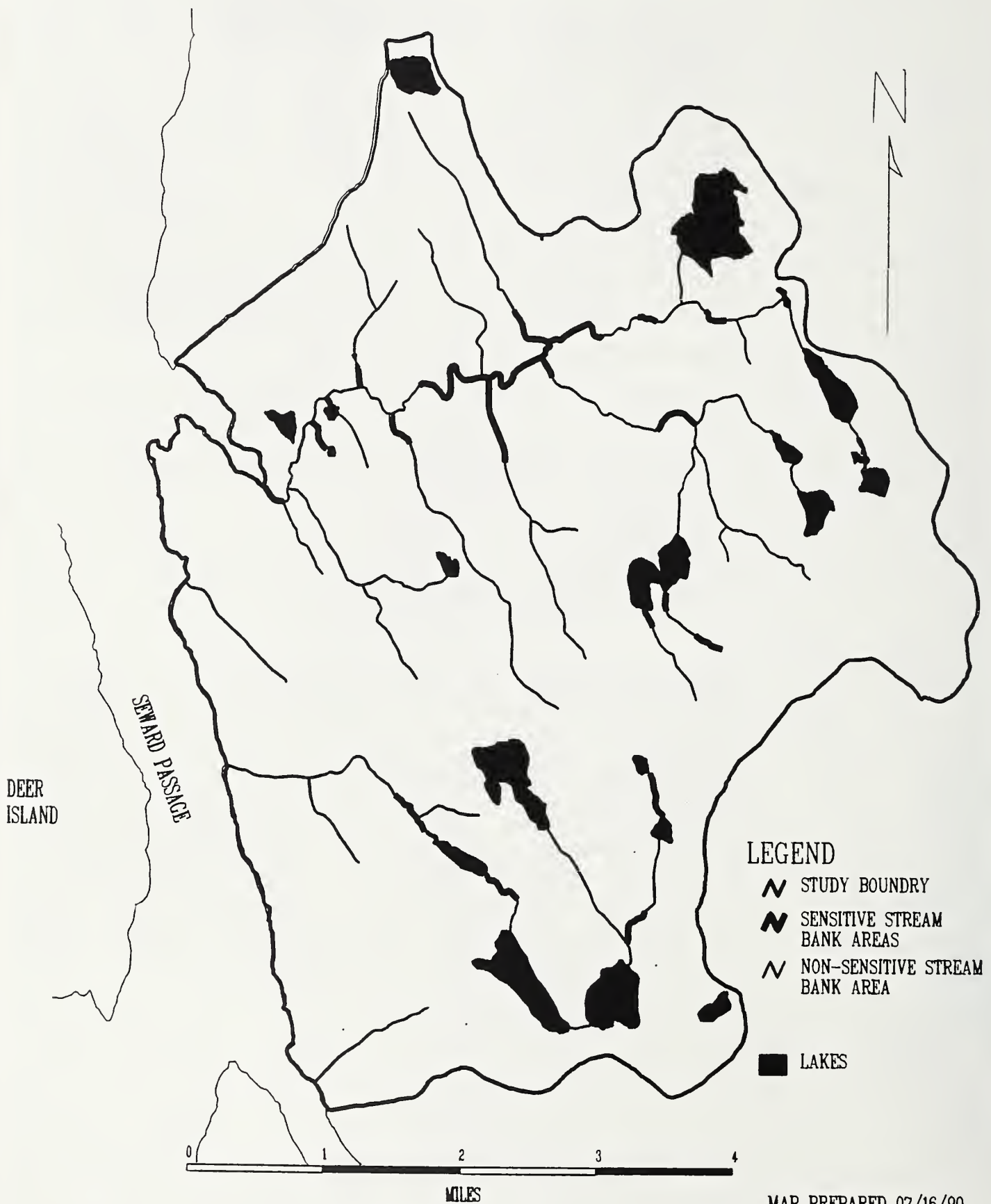
1. The length of stream channel that has banks sensitive to damage and *is also within 100 feet of a harvest unit.*
2. The *proportion of* area harvested in the watershed.
3. The amount of harvest and road building on high-hazard soils. (Although this factor is related to watershed effects, it is described in the following section, Landform and Soils.)

Sensitive Streambanks

The aquatic habitat management unit (AHMU) guidelines will be followed and there should be no noticeable long-term effect on the watersheds in most cases (see section on "fish" in this chapter for description of AHMU classes). However, the trees remaining in each AHMU near a harvest unit are at an increased risk to blow down. Thus the impact of timber harvest on watershed values is related to the probability of trees in an AHMU being blown down along stream channels sensitive to bank erosion. The probability, in turn, is related to the number of miles of sensitive streams near harvest units (see Map 4-1 and Table 4-1). Alternative 2 would harvest timber along the greatest length of sensitive streambank, followed by Alternative 3. *Alternative 3a would harvest slightly less timber along sensitive streams than Alternative 3. Some of the harvest units have been changed so they harvest on only one side of the stream instead of two sides. Alternative 4 would harvest timber along the shortest length of sensitive streambank. (Also see Unit descriptions for details on location of harvest units and sensitive streambanks for Alternative 3a.)*

Chapter 4
Environmental Consequences

Map 4-1. Location of Sensitive Streambanks



Chapter 4

Environmental Consequences

Table 4-1. Length of Sensitive Streambank¹ (In Miles) *near Harvest Units.*

	Alt 1	Alt 2	Alt 3	Alt 3a	Alt 4
1 Side of Stream	0.0	0.3	0.1	0.4	0.1
Both Sides of Stream	0.0	1.9	1.7	1.0	1.3

¹ Streams with sensitive banks include those formed by the following process groups: low gradient floodplain; alluvial fan; mixed control, moderate gradient; placid or glide; and estuaries *(see Appendix E).*

Proportion of Watershed Harvested

The total area harvested in the Frosty Creek watershed ranges from 12 to 16 percent in all action alternatives. These proportions are not expected to cause measurable or long term changes in water quality. Where harvest occurs on high hazard soils, however, there is an increased risk that soil could slide into a stream (see discussion in following section on Landform and Soils).

Cumulative Effects

*Assuming a second entry for harvest would occur in thirty years, cumulative effects are expected to be negligible. Thirty years will provide time for the watershed to recover from the initial entry. Sedimentation from the first entry is not likely when the second entry occurs. Rooting strength in harvested areas will be recovered enough that risk of slumps and slides from the first entry will return to natural levels.

Landform and Soils

The risk of impact on soils from timber harvest is often rated in terms of soil hazard classifications. Soil hazard classes reflect the probability of soil movement resulting from logging or road building activities. The probability is related to a number of factors such as soil strength, soil wetness, and slope. The soils in the low hazard class are found on 0 to 35 percent slopes. They are mostly stable in the natural setting and have little probability of soil movement if disturbed. Moderate hazard soils are generally found on 35 to 75 percent slopes. They are relatively stable in the natural setting but the probability of movement increases if they are disturbed. The soils in the high hazard class are usually found on slopes greater than 75 percent. They often creep or slide in a natural setting and are extremely prone to soil movement if disturbed. Consequences from timber harvest are related to the number of acres harvested and the soil hazard class on which the trees are growing.

Timber Harvest and Soil Hazard Class

Table 4-2 shows the area of land in each hazard class that would be harvested for each alternative. *Data presented in Table 4-2 is slightly different than presented in the Draft EIS. Field verification showed that a number of sites reported as high-hazard in the computer database were actually medium-hazard. The soils database has since been updated to reflect the results of the field verification.

Table 4-2. Area Harvested In Each Soil Hazard Class

SOIL HAZARD CLASS	ALTERNATIVE				
	Alt. 1	Alt. 2	Alt. 3	*Alt. 3a*	Alt. 4
Low	0	512	414	297	359
Moderate	0	1358	1180	963	965
High	0	145	115	16	114
Total	0	2015	1709	1276	1438

Road Building

Road building impacts are related to the length of road constructed and the soil hazard class in which each segment is built. Table 4-3 shows the miles of road in each hazard class for each alternative. A small amount of soil sliding and slumping is likely.

Table 4-3. Miles of Specified Road Proposed In each Soil Hazard Class.

SOIL HAZARD DESCRIPTION	ALTERNATIVE				
	Alt. 1	Alt. 2	Alt. 3	*Alt. 3a*	Alt. 4
Low	0	8.0	8.0	7.3	6.8
Moderate	0	5.3	5.3	5.0	4.0
High	0	0.7	0.7	0.02	0.7
Total	0	14.0	14.0	12.3	11.5

Cumulative Effects

The range of time required for potentially unstable areas to restabilize varies greatly. Some unstable areas can stabilize in as little as three to five years while others require more time. While some become chronic sources of sediment, any slides or slumps in the study area are expected to recover relatively quickly.

Wetlands and Floodplains

Since a large amount (about 63 percent) of the Frosty Study Area is classified as wetlands, they are not considered a scarce resource. Resource values associated with these wetlands varies greatly depending on the type of wetland, proximity to water bodies, landscape position, etc. Alternatives were designed to minimize potential impacts to identified high value areas rather than to avoid development on all areas classified as wetland.

The potential impact to wetlands is indicated by the amount of forested wetlands proposed for harvest (Table 4-4), and the amount of specified road proposed to be built on areas classified as wetland (Table 4-5). (Data in Table 4-5 refers to specified roads only and does not include temporary spur roads.)

Chapter 4 Environmental Consequences

Timber Harvest and Wetlands

Alternative 2 would harvest the greatest amount of forested wetlands, followed by Alternative 3 and Alternative 4. Alternative 3a would harvest the least.

Table 4-4. Timber Harvest on Forested Wetlands.

HARVEST ON WETLANDS	Alt. 2	Alt. 3	*Alt. 3a*	Alt. 4
Acres of Forested Wetlands	349	298	252	279
Percent of Forested Wetlands	9.0%	8.0%	7.0%	7.5%
Percent of Total Wetlands	3.0%	2.7%	2.2%	2.5%

Roads and Wetlands

The wetland vegetation, soil drainage or hydric character of a wetland will not be measurably altered by road construction except for the width of the roadfill itself. This is normally about 24 feet wide and amounts to approximately 2.9 acres per mile.

Alternatives 2 and 3 would both result in slightly more road construction on wetlands. Alternatives 3a and 4 would result in a greater proportion of the roads built on wetlands.

Table 4-5. Specified Road on Wetlands.

ROADS ON WETLANDS	Alt. 2	Alt. 3	*Alt. 3a*	Alt. 4
Miles of Road	9.8	9.8	9.6	8.4
Acres Covered	28.5	28.5	27.9	24.4
Percent of Specified Roads on Wetlands	37%	37%	40%	40%

Chapter 4 Environmental Consequences

Floodplains

The Executive Order dealing with floodplains was largely intended to prevent the construction and occupancy of floodplains so that flood events would not destroy property and cause loss of life. Given that a timber sale would not encourage people to build structures or live in floodplains, no effects are anticipated.

Cumulative Effects

No measurable long term effects anticipated on total wetlands, forested wetlands, or floodplains.

Fish

The impact of a timber sale on fish habitat depends on many factors. One measure of potential impacts is the extent to which trees are left standing on streambanks. Trees along the banks perform the following functions:



- hold streambanks in place,
- filter out sediment that could interfere with salmon spawning success,
- provide large, woody debris required to help create salmon and trout rearing and over-wintering habitat,
- shade water so over-heating and subsequent fish kills are less likely in temperature-sensitive streams, and
- drops needles, leaves, litter, and insects into the water, providing most of the nutrients supporting the food chain.

Guidelines for managing timber near streams have been established in the Aquatic Habitat Management Handbook and would be followed in each of the action alternatives. The guidelines were designed according to three classes of aquatic habitat management units (AHMUs). AHMUs include the portion of land encompassing the stream channel and banks as well as all flood plains and a zone of at least 100 feet on both sides of a stream. See Map 3-4 in Chapter 3 for the classification of each stream segment in the Frosty study area.

Class 1

Class 1 AHMUs contain streams with anadromous fish habitat, streams that could provide anadromous fish habitat if a structure allowed fish to pass over a migration barrier, and streams with a population of resident trout considered important for sport fishing. Stream gradient usually ranges from 0 to 6 percent. Harvest of selected trees is allowed, primarily along the outer edge of the AHMU to make it more windfirm, but as a guideline, at least 80 percent of the trees in the AHMU will be left standing along the stream banks.

Class 2

Class 2 AHMUs contain streams with resident fish populations only. The populations have some sport fishing values and may contain catchable-sized fish. They generally occur upstream of migration barriers or steep gradient streams that preclude anadromous fish use. Stream gradient usually ranges from 6 percent to 15 percent. Again, harvest of selected trees is allowed, but as a guideline, at least 40 percent of the trees in the AHMU will be left standing along the stream banks.

Chapter 4 Environmental Consequences

Class 3

Class 3 AHMUs contain streams that, while having no fish populations, could affect downstream water quality and fish habitat. Stream gradient is usually greater than 15 percent. Once more, harvest of selected trees is allowed, but as a guideline, at least 10 percent of the trees in the AHMU will be left standing along the stream banks.

If these guidelines are followed, no measurable effect is anticipated and there will be no habitat-related reduction in the fish population. However, the trees remaining in each AHMU are at risk to blow down. Thus the potential impact of timber harvest on fish is related to the probability of trees within an AHMU being blown down. Probability, in turn, is related to the number of miles of stream requiring AHMU prescriptions and whether both sides of the stream would receive impact or only one side. Alternative 2 would require AHMU prescriptions of the greatest length, followed by Alternative 3 and 3a (see Table 4-6). Alternative 4 would require prescriptions along the shortest length.

Some blowdown is expected within the strips of trees left standing along the streams. The amount of blowdown is not expected to be great. When blowdown does occur, the fallen trees will be left in, or suspended over the streams to provide sources of large woody debris. Trees that have been blown down facing away from the streams may be salvaged if other resource objectives are met, such as protection of marten or bear habitat by leaving an adequate number of denning logs.

Table 4-6. Miles of Stream Requiring Class 1, Class 2, and Class 3 AHMU Prescriptions.

AHMU CLASS	MILES OF STREAM REQUIRING PRESCRIPTION				
	Alt. 1	Alt. 2	Alt. 3	*Alt. 3a*	Alt. 4
Class 1: 1 side	0.0	0.6	0.7	0.4	0.1
Class 1: 2 sides	0.0	0.8	0.6	0.8	0.5
Class 2: 1 side	0.0	0.7	0.5	2.1	0.6
Class 2: 2 sides	0.0	4.2	3.6	1.1	2.4
Class 3: 1 side	0.0	1.2	0.8	1.1	0.7
Class 3: 2 sides	0.0	2.3	1.6	0.8	1.2
Total: 1 side	0.0	2.5	2.0	3.6	1.4
Total: 2 side	0.0	7.3	5.8	2.7	4.1
Total: 1 and 2 sides	0.0	9.8	7.8	6.3*	5.5

***Cumulative
Effects***

There is very little fishing pressure on the resident trout in Frosty Creek. Increased access provided by the establishment of a road system would probably result in a slight increase in levels of sport fishing within the study area during and after completion of the sale, and may cause a slight decline in the population, especially of larger fish.

Wildlife Habitat Retention

A total of 1191 acres would be retained for wildlife habitat following current direction, or 2300 acres according to the Draft Forest Plan Revision direction. The actual areas selected for retention in the Frosty study area were based on current direction and Alternative 3a, the preferred alternative (see Map 4-2). They include beach fringe, eagle nest trees, and other areas that were dropped from the other alternatives to create Alternative 3a. Appendix H shows the habitat tentatively retained according to the direction in the Draft Forest Plan Revision.

Threatened and Endangered Species

There is no critical habitat, such as feeding areas, haul-outs or rookeries, for humpback whales or sea lions in the vicinity of Frosty Bay. There are no other listed plants or animals known to frequent or occur in the vicinity of the study area. Therefore, this sale should have no adverse impacts on any threatened or endangered species.

Wildlife

The consequences of timber harvest on some wildlife species were analyzed with the use of habitat suitability models developed for the Forest Plan revision. The models generate habitat suitability indexes that indicate differences in trends between alternatives rather than absolute values. The habitat suitability index (HSI) models generate a range of values from 0 to 1, with "0" having no value for a particular species and "1" indicating optimum habitat. A value of 0.25 indicates an area with the ability to support 25 percent of the animals that the very best habitat could support.

The models were used on Sitka black-tailed deer, pine marten, *and black bear.* Two figures were estimated for both species: (1) immediate impact and (2) cumulative effects of harvest over the 100-year rotation as described in the Forest Plan. The biological relationships expressed in the models were assumed to be valid for an estimate of the effects on Vancouver Canada geese and bald eagle.

Sitka Blacktailed Deer



Alternative 2 reduces carrying capacity by 36 percent while Alternative 3 reduces carrying capacity by 30 percent, *Alternative 3a by 20 percent,* and Alternative 4 by 19 percent.

Much of the land is low in value as winter range, and wolf predation is also thought to keep deer numbers low. *According to the HSI model, the deer habitat within the Frosty area is currently capable of supporting approximately 811 of the 2063 deer that an equal area of optimum habitat could support (see Table 4-7).

Map 4-2. Location of Wildlife Habitat Retention for Alternative 3a.

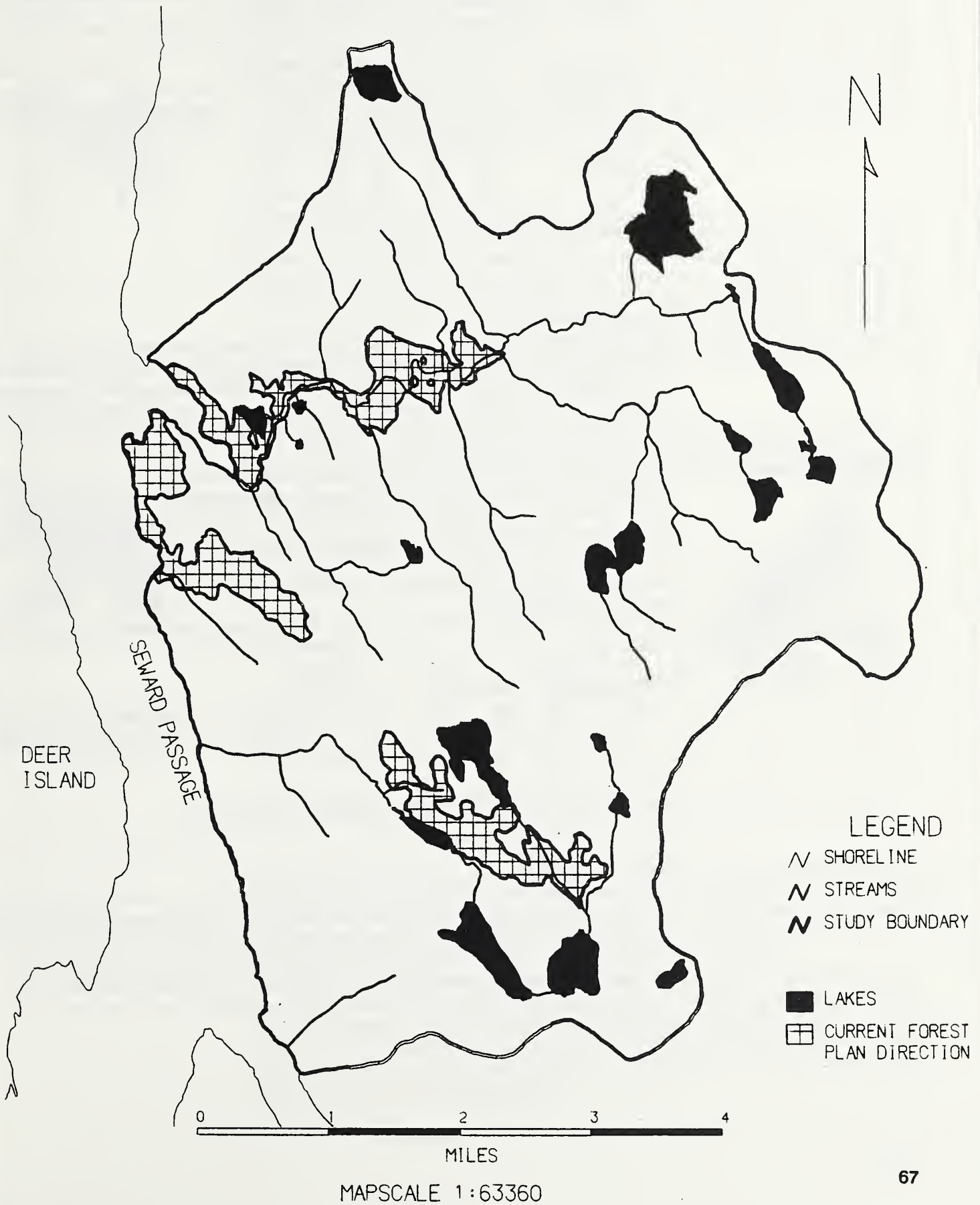


Table 4-7. Number of Deer the Frosty Area Could Support in each Alternative.

SEVERITY OF WINTER	NUMBER OF DEER						Cumulative Effects At End of 100-Year Rotation ¹
	Alt. 1	Alt. 2	Alt. 3	*Alt. 3a*	Alt 4	Optimum Habitat	
Mild	811	705	724	744	745	2063	533
Moderate	356	285	298	312	313		211
Severe	136	94	102	111*	110		66

¹ Assuming maximum harvest allowed by Forest Plan.

Cumulative Effects

The model was also used to estimate the cumulative impacts of multiple entries into the area. If the maximum amount of timber allowed under Forest Plan direction were harvested (95 percent of the operable CFL over the 100-year rotation), the population would decline from 136 to 66 animals during a severe winter. The road system would improve access to the area. As a result, hunting effort might increase.

Pine Marten



According to the HSI model, the area is currently capable of supporting approximately 36 of the 73 marten that an optimum habitat could support because much of the land is low in value as marten habitat (see Table 4-8). Alternative 1 would support 36 marten, the maximum for the Frosty area. Alternative 2 would support 30 marten; Alternative 3, 31 marten; and Alternatives *3a and* 4, 32 marten.

Table 4-8. Number of Pine Marten the Frosty Study Area Could Support in each Alternative.

NUMBER OF MARTEN						Cumulative Effects At End of 100-Year Rotation ¹
Alt. 1	Alt. 2	Alt. 3	*Alt. 3a*	Alt. 4	Optimum Habitat	
36	30	31	32	32	73	23

¹ Assumes maximum harvest allowed by the Forest Plan.

Cumulative Effects

The model was also used to estimate the cumulative impacts of multiple entries into the area. If 90 percent of the riparian marten habitat were harvested, and 95 percent of the non-riparian operable CFL were harvested over the 100-year rotation (the maximum allowed under Forest Plan direction), the population would decline to 23 animals. Roads would allow access to the upper Frosty Creek watershed by snowmobile in winter. This could result in more trapping, which could reduce the marten population.

Chapter 4

Environmental Consequences

Vancouver Canada Goose



The impacts of a timber sale on the Vancouver Canada Goose are related to the amount of riparian, old-growth habitat remaining after harvest. In this area, geese nest in old-growth timber although they do feed around the edges of openings such as meadows and muskegs. The goslings are dependent on timber and heavy brush for hiding cover. Each action alternative would follow Aquatic Habitat Management Handbook (AHMU) guidelines and would protect most of the existing goose habitat by providing buffers along streambanks. During harvest activities, geese may avoid habitat along roadsides and reoccupy these areas once the traffic ceases. Adult and juvenile geese may use young clearcuts for foraging.

Cumulative Effects

The impacts of logging activities on nesting geese are not well known. *A study has already begun to inventory the goose population in order to* evaluate the impact of logging and road building on nesting geese, on the number of years before geese reoccupy disturbed sites, and on differences between use of clearcuts and second-growth forest as compared to old-growth forest. *The goose study team estimates 5-10 breeding pairs of geese and 40-60 moulting, non-breeders, which is fewer than anticipated. If the results of this study indicate a need to mitigate effects on goose habitat, funding could come from timber sale receipts (Knutson-Vandenberg or KV funds) or from some other source of funding.*

Black Bear



Black bears use old growth timber for denning sites, and to a lesser degree, for foraging. Alternative 2 would harvest 35 percent of the high-volume old-growth habitat while Alternatives 3 and 4 would harvest 29 percent (see Table 4-9). Alternative 3a would harvest 16 percent.

Table 4-9. Proportion of High-Volume (30-50,000 Bd Ft/Ac) CFL Harvested Within the Study Area.¹

CFL ACRES	PERCENT HARVESTED				
	Alt. 1	Alt. 2	Alt. 3	*Alt. 3a	Alt. 4
958	0	339	280	187	276
100%	0%	35%	29%	19%*	28%

¹ This is the percentage harvested of all the volume class 6 in the study area.

Clearcutting eliminates the large hollow logs and trees used by bears for denning, but improves the site's berry production. As long as there are still sufficient remaining old growth stands for denning, the short term impact of timber harvest on bears is essentially neutral. The early impacts, for the first 25 years after harvest, show no significant decrease in black bear carrying capacity (Table 4-10).

After the canopy closes on a second growth stand, between 20 and 40 years, berry production is eliminated but the new trees are not large enough to provide suitable den sites. According to the model, second growth stands have no value for bears until they reach 150 to 200 years of age. Long term impacts of timber harvest tend to be negative. The long term effects, from age 25 to 150, show a 6-9 percent decline in black bear carrying capacity.

Table 4-10. Black Bear Carrying Capacity.

IMPACTS	NUMBER OF BEARS					Cumulative
	Alt. 1	Alt. 2	Alt. 3	*Alt. 3a	Alt. 4	
SHORT-TERM	32	32	32	32	32	NA
LONG-TERM	32	30	30	31	31	25

Cumulative Effects

In the Frosty study area there are 958 acres of high-volume, old-growth forest. Of this, 768 acres are operable. Current Forest Plan direction allows the harvest of 95 percent of these stands. If this maximum harvest were to occur over the rotation, at the end of 100 years there would be a total of 228 acres, or 24 percent of the high-volume, old-growth remaining. Some bear denning can occur in low and moderate volume old-growth forests. Based on the same 95 percent assumption, there would be 2138 acres (39 percent) of the low-volume and 1157 (35%) of the moderate-volume old-growth remaining at the end of the rotation. According to the HSI model, this would result in a 22 percent decline in the black bear carrying capacity at the end of the 100 year rotation.

Bald Eagle



The consequences of timber harvest on bald eagles are related to the extent to which active nest trees are avoided and beach fringe habitat is left standing. Most eagle nests are found within the beach fringe, within 500 feet of mean high tide. Three eagle nest trees have been found in the general vicinity of proposed sale activities. In each action alternative the nests will be protected.

Alternative 2 would harvest 80 acres of beach fringe and reduce eagle nesting habitat by 16 percent. Alternatives 3 *and 3a* would harvest 13 acres and reduce habitat by 3 percent. Alternative 4 would not harvest any beach fringe habitat.

Cumulative Effects

*There are approximately 500 acres of eagle nesting habitat in the Frosty study area, 155 (31 percent) of which have been retained in preferred alternative 3a for wildlife habitat purposes. This includes the minimum 330 foot buffer around existing nest trees. If the remaining 70 percent of the habitat were harvested, as the current Forest Plan allows, there would be considerably fewer sites available for replacement eagle nests. The preferred alternative of the Forest Plan Revision would allow harvest of only 87 acres of the eagle nesting habitat, including the nine acres harvested in 1947 and 13 acres harvested in Alternative 3a. According to the Revision preferred alternative, only 17 percent of the potential eagle nesting habitat would be logged during the remainder of the 100 year rotation.

Chapter 4

Environmental Consequences

Mountain Goat

A very small percentage of the habitat for the population of goats to the north of Frosty Creek occurs in the study area. Of this, Unit 22 would cut 10 acres of potential winter range. This is too small an area to have a significant impact on this herd of goats. What could have more impact is the easier access to the goat population in the Frosty area for the next three to five years and beyond. The small, isolated population could be overharvested. Access to the ridge system will not be as easy once the bridge across main Frosty Creek is removed. The Alaska Department of Fish and Game (ADFG) is proposing to close the goat hunting season in this area during sale activities in order to mitigate the possibility of overhunting. The Forest Service will coordinate with ADFG by informing them when sale activities begin.

Cumulative Effects

According to the Forest Plan, up to 500 of the 850 acres of goat winter range in the Frosty study area could be harvested over the 100 year rotation. This 500 acres is 7 percent of the 7500 acres of winter range habitat available to this goat population and is not expected to have much impact. If the improved access results in overhunting, ADFG may wish to limit goat harvest in this area after the sale.

Subsistence

*This section evaluates whether or not there is a significant possibility of a significant restriction of subsistence use in the Frosty study area. The evaluation considers the effects of each alternative on:

1. changes in access to subsistence resources,
2. changes in abundance or distribution of subsistence resources, and
3. changes in competition from non-subsistence uses for those resources.*

Access

Alternative 1 would maintain the unroaded character of the Frosty area. Access would remain by foot or by floatplane. Alternatives 2 and 3 would provide 14 miles of permanent, specified road that would improve access to subsistence resources. Alternative 3a would provide 12.2 miles of specified road and Alternative 4 would provide 11.6 miles.

Abundance and Distribution

The harvest of timber in the area would reduce the amount of habitat available for a number of subsistence species, including sitka black-tail deer, marten, and black bear.

***Deer**

The Sitka black-tail deer model predicts that the population of deer would be reduced between 6 percent and 25 percent depending on the alternative and the severity of the winter (see Table 4-7). During a mild winter the population would be reduced by 11 percent in Alternative 2, 8 percent in Alternative 3, 6% in Alternatives 3a and 4. No impact is anticipated on subsistence use because there is very little documented use of deer in the Frosty area (see Chapter 3).*

***Marten**

The marten model predicts that timber harvest would result in a decline of 8 percent to 14 percent in the marten population (see Table 4-8). The population would be reduced by 14 percent in Alternative 2, 11 percent in Alternative 3, and 8 percent in Alternatives 3a and 4. Again, no impact is anticipated on subsistence use because the only documented use of marten in the Frosty area is for commercial purposes.*

Chapter 4

Environmental Consequences

***Black Bear**

The black bear model predicts that the population would be reduced by 3 percent to 6 percent (see Table 4-10). The population would decline by 6 percent in Alternatives 2 and 3, and 3 percent in Alternatives 3a and 4. Again, no impact is anticipated on subsistence use because there is no documented use of black bear in the Frosty area.*

***Salmon**

Changes in the salmon population are not anticipated in any of the action alternatives. All proposed cutting units near existing or potential salmon spawning and rearing streams are protected by no-cut and transition buffers as defined in the AHMU Handbook and described in the Unit Descriptions in Appendix E. Thus the impact on salmon harvest for subsistence use would be negligible.*

***Other Finfish**

The action alternatives are projected to have no impact on other finfish habitat. Therefore the subsistence use would not be affected.*

***Marine Mammals**

The small population of harbor seals that uses Frosty Bay and the surrounding waters may be temporarily displaced by water-based logging activities. This would only occur during the three to five years of sale activity. Since there is no documented harvest of marine mammals in the Frosty area, the impact of this sale on subsistence use is expected to be low and temporary.

Changes in Competition From Non-Subsistence Users

During the life of the timber sale, it is likely that an average of 50 people will live and work out of a camp near Frosty Bay for up to five years. Some residents of the camp may meet residency requirements and qualify as subsistence users, and all residents could purchase sport hunting and fishing licenses. There is likely to be an increase in use of subsistence resources by camp residents, however the lack of subsistence use in the area at this time suggests there are few if any subsistence users with whom camp residents could compete. Consequently, no increase in competition is anticipated.

Cumulative Effects

The HSI habitat models predict that the population of deer could decline by 34 percent to 51 percent over a 100-year rotation, depending on the severity of winters. This is true for all action alternatives and would result in a population ranging from 66 to 533 deer. The marten population could decline by 36 percent to 23 animals, and the bear population could be reduced by 22 percent to 25 animals. These effects are not anticipated to have any effect on subsistence use because the use of fish, game, and other subsistence resources in the area is low.

ANILCA Section 810 Finding:

Based on the low level of subsistence use in the Frosty study area, and the fact that viable populations of subsistence species will remain intact, there is no significant possibility that any of the action alternatives would result in a significant restriction of subsistence uses.

Hunting and Trapping

Access to the Frosty area would be improved as a result of roads associated with a timber sale and there would probably be an increase in the extent to which the area was used for hunting and trapping. This may result in a reduction in these populations.

***Cumulative
Effects***

The HSI model predicts that the marten population could be reduced from 36 to 23 animals over the 100-year rotation.

Recreation

A number of consequences are common to all of the action alternatives:

1. The character of some recreation opportunities would change from undeveloped and primitive to modified and motorized. This is consistent with the area's LUD IV status. (See Table 4-6 for changes in recreational opportunity.)
2. The construction of roads would provide easier access for subsistence use, hunting, hiking, sport fishing, and for other recreation opportunities within the area.
3. The carrying capacity for old-growth-dependent species would decrease, and with it, the likelihood of hunting success.
4. The area would become more attractive as a destination site if a sale administration cabin is converted for use as a recreation cabin following the timber sale. Development of a trail system would also contribute to the attractiveness of the area and recreation use would probably increase slightly as a result.

Alternative 1 would leave the recreation opportunities unchanged. Frosty Bay would remain an undeveloped recreation attractor and use would continue to be dispersed and light to nonexistent. Although recreation could be developed in the area regardless of timber harvest, it would be less likely to occur as soon.

Alternative 2 would build the same amount of specified road as Alternative 3, but with more spur roads, thereby providing the greatest access. It would also convert the greatest area from Primitive recreation opportunities to Natural-Roaded and Roaded-Modified opportunities (see Table 4-11). It would also have the greatest impact on wildlife populations. Alternative 2 would harvest timber along the southwest edge of Frosty Bay, risking the chance that winds could blow across a previously protected anchorage. Although the anchorage is not considered a destination site, it is occasionally used by commercial fishermen and recreational boaters in stormy weather.

Table 4-11. Changes in Type of Recreational Opportunity.

RECREATION OPPORTUNITY	ACRES PER ALTERNATIVE				
	Alt. 1	Alt. 2	Alt. 3	*Alt. 3a*	Alt. 4
Primitive	13,089	6,044	6,044	6,044	8,820
Semi-Primitive, Non-Motorized	4,089	5,049	5,187	5,187	4,211
Semi-Primitive, Motorized	1,643	3,333	3,336	3,336	3,950
Roaded Natural	0	0	152	152	110
Roaded Modified	0	4,395	3,890	3,890	1,370

Alternatives 3 and 3a would change the recreation opportunities in much the same way as Alternative 2 (see Table 4-11). They would build as much specified road, build almost as much spur road, provide almost as much access, and convert many of the recreation opportunities from Primitive to Roaded and Modified. Wildlife carrying capacity would be reduced by nearly the same amount as in Alternative 2. Also note in Table 4-6, a small Roaded Natural area would be created where segments of road pass through large stands of timber not scheduled for immediate harvest. Alternatives 3 and 3a would pose less risk than Alternative 2 to the wind protection in the Frosty Bay anchorage. Alternative 4 would build the least road and provide the least access. It would also leave the greatest area in Primitive status for recreation opportunities. This alternative would create a smaller Roaded Natural area than Alternatives 3 and 3a. Alternative 4 would have the same impact on wind protection in Frosty Bay as Alternatives 3 and 3a and less impact than Alternative 2.

Cumulative Effects

All of the action alternatives would provide greater access to the area and shift the nature of the recreation experience from Primitive to Natural Roaded and Roaded Modified. The area will probably be used more than in the past for recreation purposes.

Wild and Scenic Rivers

None of the action alternatives would have any effect on the Wild and Scenic river resource because there are no streams in the Frosty study area that are eligible for Wild and Scenic designation.

Cultural Resources

The three known sites in the study area are surrounded by buffer strips and will not receive impact. It is more difficult, however, to predict the effects on sites that have not yet been identified. Ground disturbing activities can damage these sites. The area of ground disturbed in each alternative is displayed in Table 4-12.

Alternative 2 offers the greatest chance of damaging undiscovered sites. Alternative 3 provides slightly less chance of damage, followed by Alternative 3a, and Alternative 4 is least likely to damage sites. The helicopter units would probably not increase the risk of damage because the units are on steep hillsides, and are not where past human use is likely to have occurred.

Table 4-12. Ground Disturbing Activities.

	Alt. 1	Alt. 2	Alt. 3	*Alt. 3a*	Alt. 4
Specified Road Miles	0.0	14.0	14.0	12.2	11.6
Spur Road Miles	0.0	11.0	7.4	7.1	5.7
Acres of Harvest	0	2012	1706	1273	1435

Cumulative Effects Impacts from decay, natural landscape changes, and development pose a threat to the preservation of significant cultural resources in the Frosty Bay area. Future timber development combined with other ground disturbing activities could result in a loss of cultural resources. Because little inventory has been conducted in the study area, it is impossible to determine the exact number and nature of cultural resources that are potentially threatened by future development. Implementation of field inventories and various mitigation measures will reduce the potential loss by preserving significant sites and by providing data on those that can not be preserved.

Visual Resources

The impact of a timber sale on visual resources in the Frosty area is related to the extent to which harvest units are obvious from saltwater travel routes. Visual impacts were analyzed by generating computerized images of the portions of the harvest area visible from saltwater (see Figure 4-1 for view of harvest units with each alternative.) A number of consequences are common to all action alternatives:

1. Most of the road system would create relatively minor visual impacts. Roads in the seen area would be screened by vegetation or topography except where they enter harvest units. (Refer to Chapter 2 for mitigation recommendations.)
2. Most rock pits have been located outside of visible harvest units and screened from Frosty Bay and Seward Passage by vegetation or landforms. If situations in the field require a planned rock pit location to be moved, an attempt will be made to keep rock pits out of units visible from saltwater. This involves Units 1, 2, 3, 7, 8, 15, 17, and part of 6. The rock pit adjacent to the log transfer facility is likely to have a visual impact. It would not be seen from Seward Passage, but could be a major visual impact to Frosty Bay due to its size and proximity to the beach. The roadbed would help screen part of the pit. (Refer to Chapter 2 for mitigation recommendations.)
3. A floating camp would change the view for three to five years. An inland camp would be sited so as not to be visually obtrusive to Frosty Bay or Seward Passage. The proposed sort yard location adjacent to Unit #5 would not be seen from marine travel routes. Fuel storage and maintenance shed locations are not known at this time, but will be sited with consideration of visual impacts.
4. Several timber harvest units were recently cut on Deer Island are located on steep, visible slopes. Although the Deer Island and Frosty harvest areas are several miles apart, cumulative visual impacts would be evident to visitors travelling through Seward Passage. Second growth stands are apparent near the mouth of Frosty Bay.
5. Most helicopter units are located inland and would not be seen or would be only partially visible from a distance. Unit 22 would be obvious from Seward Passage and Frosty Bay due to its position high on the ridge. (Refer to Chapter 2 for mitigation recommendations.)

Chapter 4

Environmental Consequences

6. When the proposed administrative cabin in Frosty Bay is made available for recreation use, the Sensitivity Level rating (measure of viewer interest in scenic quality) will change from a Level 2 to a Level 1 within Frosty Bay. Subsequently, the Visual Quality Objectives for the landscape seen from the cabin will change from Modification to Partial Retention in the foreground and middleground viewing distances (0 - 1/2 miles and 1/2 - 5 miles). All proposed action alternatives except for Alternative 2 are likely to meet the Partial Retention VQO by the time the cabin is turned over to recreation use. The LTF site is likely to meet a VQO of Partial Retention if it is removed.

Alternative 1

In Alternative 1 the area would remain in its natural visual condition. Though inventory visual quality objectives (VQOs) are Modification in the seen area and Modification and Maximum Modification in the unseen area, the visual condition would be consistent with a VQO of Preservation.

Alternative 2

In Alternative 2 the visual condition in the seen area would be consistent with a VQO of Maximum Modification, conflicting with the inventory VQO of Modification. Some of the harvest units would dominate the view from marine travel routes. The cumulative impact of the log transfer facility, the road development, and the timber harvest would be strongly evident to boaters using Frosty Bay for anchorage, and to users of the administrative cabin. When the cabin is later made available for recreational use, the impacts would still be obvious.

The road likely to cause the greatest visual impact from Seward Passage is the section parallel to the beach around Need Point to Frosty Bay. Following harvest, it is unlikely that the 100-foot-wide beach fringe would screen Unit 3 from view.

Units with potential to cause the greatest visual impacts are 1, 2, 3, 4, 6, 7, 8 and 17. The remaining units would either not be seen from nearby travel routes or their visual impacts would be slight. Harvest activities proposed in the unseen portion of the study area would be consistent with inventory VQOs of Modification and Maximum Modification.

Cumulative Effects

Fifty years after harvest, units from the first entry would no longer be obvious to a casual observer. Rock pits and roads would be screened by vegetation. A second entry at that time would be similar in visual impact to a first entry situation and could be designed to meet inventory VQOs.

Alternative 3

In Alternative 3 the visual conditions would meet the inventory VQOs of Modification as seen from Seward Passage and Frosty Bay, and Modification and Maximum Modification in the unseen area.

Units 1, 2, 3, 6, 7, 8, 17, and 21 would be obvious, but most unit shapes and sizes would resemble natural landscape patterns. Smaller portions of other units would be visible as well, but their shapes would appear natural. In 5 to 10 years, when units green up and road beds are overgrown, harvest units in the middle ground and background are likely to appear as natural occurrences in the landscape. From the Seward Passage side of the Need Point Peninsula, Unit 3 would come over the ridgetop leaving a narrow band of trees close to a square, upslope corner in Unit 2. This arrangement would attract attention with its unnatural lines. The log transfer facility, road, and rock pit development would be evident, but vegetative screening between the road and shoreline could make these impacts acceptable in the context of a LUD IV area.

Map 4-3. Location of Viewpoint for Visual Appearance of Proposed Harvest

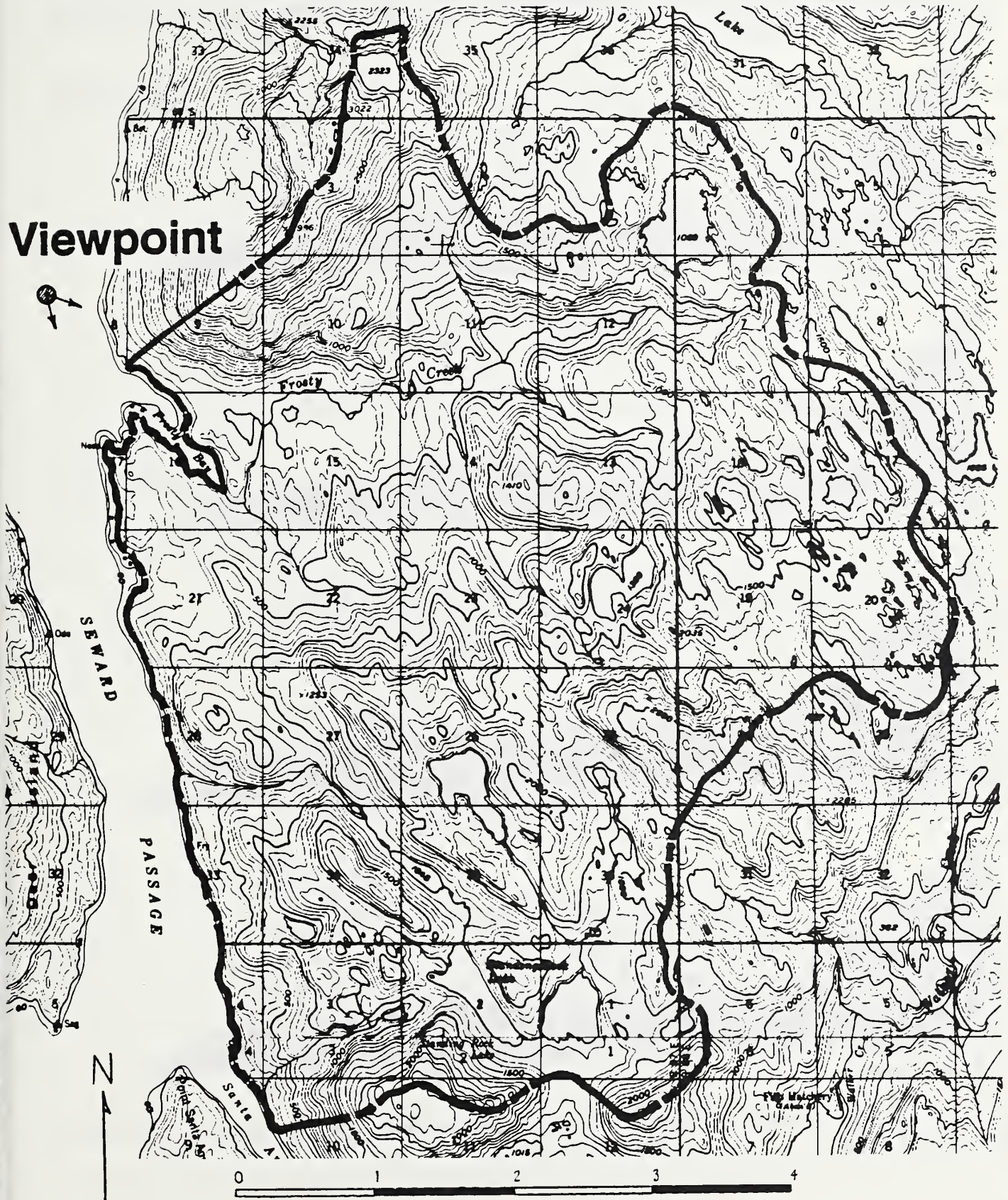


Figure 4-1. Visual appearance of harvest proposed in Alternatives 2, 3, and 4 as viewed from Seward Passage.¹



Alternative 1



Alternative 2



Alternative 3



Alternative 4

¹Plots do not display the mountains behind the harvest units because the terrain model used includes only the first four miles inland.

Chapter 4

Environmental Consequences

Cumulative Effects

Thirty years after harvest, the landscape's visual condition would be consistent with a VQO of Partial Retention. Units would still be noticeable due to a difference in tree height; however, color and texture would be similar to that of adjacent old growth. A second entry at that time could be designed to meet inventory VQOs.

Alternative 3a

Generally the visual impacts of this alternative would be slightly less than those identified for Alternative 3. A computerized simulation would show very little change from the simulation of Alternative 3, displayed on the previous page. Unit 3 is smaller and would have less visual impact on both Frosty Bay and Seward Passage. The eastern boundary of Unit 1 follows the natural slope breaks more closely, creating a more natural, undulating line. Also, the beach fringe for this unit has been widened near the creek mouth to increase vegetative screening from saltwater.

However, changes to Unit 8 will cause it to appear slightly larger (more as it appears for Alternative 2) and would leave a line of trees along the ridgetop, while the other alternatives harvest over the ridgetop. The shadow line from the ridgetop trees will attract some attention. The square, upslope corner in Unit 2 is still likely to contrast with the natural landscape but is likely to meet a VQO of Modification.

Cumulative Effects

Cumulative effects for Alternative 3a would be similar to those described for Alternative 3.

Alternative 4

In Alternative 4, looking from Seward Passage south of Need Point, the visual condition would be consistent with a VQO of Retention, not the inventory VQO of Modification. Portions of harvest units would be visible but would not attract the attention of a casual observer.

Looking from Seward Passage north of Need Point, and from Frosty Bay, the visual condition would meet the inventory VQO of Modification. The log transfer facility and road would be obvious from within Frosty Bay and the northern portion of Seward Passage. In the unseen area, the visual condition would meet the inventory VQOs of Modification and Maximum Modification.

Cumulative Effects

Thirty years after harvest, the landscape's visual condition would be consistent with a VQO of Partial Retention from Seward Passage north of Need Point, and Retention south of Need Point. Units would still be noticeable due to a difference in tree height; however, color and texture would be similar to that of adjacent old growth. A second entry at that time could be designed to meet inventory VQOs.

Minerals

In order to obtain construction materials for roads described in the action alternatives, rock quarries would be developed at points along the road. Mining interests could examine the exposed rock formations to more accurately estimate the minerals potential of the area. Alternative 2 would expose the greatest area for examination, followed by Alternative 3, 4, and 3a. Table 4-3 displays the amount of ground disturbance occurring in each alternative. The helicopter option would not require any additional road construction. There are no known valuable minerals occurring in the Frosty study area.



Forest Plan Guidance

Readers of this Final EIS who refer to the Forest Plan Administrative Record will find that the Forest Plan inventory for the Frosty study area does not agree with the figures used in this Final EIS (see Table 4-13). The figures in the Forest Plan were based on the analysis of 240 photo points from aerial photographs. The figures in this EIS were developed from a more recent and detailed inventory which was put into a computerized database. The newer database is considered to be more accurate for the Frosty study area.

Table 4-13. Comparison of Volume Classes In Forest Plan Inventory and Frosty EIS Inventory.

VOLUME CLASS Board-Feet/Acre	Forest Plan Acres	Frosty EIS Acres
Less than 8,000	75	96
8-20,000	3,120	5,478
20-30,000	2,469	3,350
30-50,000	1,796	958
50,000+	0	0
TOTAL	7,460	9882

The Forest Plan provides guidance on the proportion of harvest that should occur in each volume class in order to attain timber harvest goals over a 100-year rotation (see fifth column, Forest Plan Goal, in Table 4-14). These figures are averages that should be achieved over the entire Tongass National Forest over time, and are not expected to be matched on every timber sale. Sometimes it is not possible to match the Forest Plan goal on an individual timber sale. For example, the Forest Plan suggests that nine percent of each sale should be taken from volume class 7, but there is no volume class 7 timber in the Frosty study area.

Chapter 4 Environmental Consequences

None of the action alternatives can match the Forest Plan goal on this sale because there is no volume class 7 timber in the area. None of the action alternatives is obviously better than another in meeting the long-term goal for the Forest Plan over time. All alternatives would harvest more of the lower volume class timber, and less of the higher volume timber, than suggested in the Forest Plan.

Table 4-14. Comparison of Volume Classes Harvested In Action Alternatives.

Vol Cls	Study Area Occurrence			Occurrence In Each Alternative			
	Frosty EIS Inventory CFL	Operable CFL	Forest Plan Goal	Alt 2	Alt 3	Alt 3a	Alt 4
3	96 (01%)	96 (01%)	--	--	--	--	--
4	5478 (55%)	4040 (54%)	27%	788 (39%)	696 (41%)	509 (40%)	599 (42%)
5	3350 (34%)	2523 (34%)	38%	886 (44%)	731 (43%)	577 (45%)	561 (39%)
6	958 (10%)	772 (11%)	26%	339 (17%)	280 (16%)	187 (15%)	276 (19%)
7	0 (00%)	0 (00%)	09%	0 (00%)	0 (00%)	0 (00%)	0 (00%)
SUM	9882	7431	100%	2013	1707	1273	1436

Timber Economics

The purpose of a financial analysis is to provide a means of comparing the short-term costs and revenues for each alternative. In this analysis, the net value of each alternative was derived by subtracting all production costs, including an allowance for profit and risk, from end-product selling values.

Timber markets vary during the timespan between planning and actually selling a timber sale. It is not uncommon for timber values to change by as much as \$200 per thousand board feet during this period. Due to these market variations, the estimate of timber end-product selling value was based on a median or middle level of the timber market.

Manufacturing costs were then subtracted to determine "pond log value," or what the log is worth before processing. In addition, to test whether the sale would constitute an economic offering, an allowance for 60 percent of normal profit at the middle market level was included in determining the timber value. Woods production costs were then subtracted from this value in table 4-15 to arrive at the total net value of each alternative. Table 4-15 also shows costs and values in dollars per thousand board feet to highlight differences between alternatives.

Value exceeds costs in all four action alternatives. None of the alternatives is expected to produce a deficit sale. Table 4-15 shows economic factors that were considered for both logging systems included in each alternative: cable logging (mainly high-lead), and helicopter logging. Table 4-16 shows cable systems and helicopter logging combined.

Chapter 4

Environmental Consequences

The volume class mix did not vary enough between alternatives to produce a significant difference in timber value per thousand board feet (MBF). For the the same reason, the stump-to-truck logging costs of the cable portion of each alternative are nearly the same. The stump-to-truck costs for helicopter logging are approximately \$45 per MBF higher than for cable but this is somewhat offset by the fact that no additional road is needed for helicopter volume. This produces a net value for the helicopter volume of from \$57 per MBF to \$79 per MBF greater than the cable volume. This is a major factor when comparing the total value of alternatives, since Alternative 3a includes only the field verified, feasible volume of 5 MMBF of helicopter volume. The other action alternatives include all 12 MMBF from the Draft EIS and therefore show a greater value than Alternative 3a.

For timber economics, the greatest real difference between alternatives is in the cost of road per thousand board feet harvested. This difference is due to the varying volume of timber harvested per mile of road built in each alternative. Alternative 2 harvests the most timber along each mile of road built, so the roading cost per thousand board feet is the lowest. Conversely, Alternative 4 harvests the least timber along each mile of road build. Therefore even though Alternative 4 builds the least amount of road, the cost of road per thousand board feet is the highest.

Alternative 2 has a slightly higher spur road cost because it has larger units harvesting more timber away from the specified, mainline roads. The truck haul of the helicopter units is slightly higher because most of them come into the system at the far end of the roads. The water haul cost of each alternative is the same since the final mill destination is the same for each.

Table 4-15. Timber Values and Costs to an Operator of Average Efficiency (Helicopter and Cable listed separately).

ECONOMIC FACTOR	Cable Alt. 1	Cable Alt. 2	Cable Alt. 3	Cable Alt. 3a	Cable Alt 4	Helicopter (All Alts)
VALUE (\$/MBF) (pond log minus 60% normal profit)	0	292	296	296	296	295
COSTS (\$/MBF)						
Stump-to-Truck	0	124	126	126	126	171
Specified Road	0	66	86	80	94	0
Spur Road	0	38	33	33	33	0
Truck Haul	0	7	7	7	8	10
Water Haul	0	23	23	23	23	23
Total Costs	0	258	275	269	284	204
NET VALUE (\$/MBF) (Possible Return to Government)	0	34	21	27	12	91

Chapter 4 Environmental Consequences

The possible return to the government of each alternative is shown at the bottom of Table 4-16. The preferred alternative, 3a, appears to be the least cost effective. As mentioned above, this is due mainly to the smaller helicopter volume in Alternative 3a. If only this feasible volume were included in the other alternatives, 3a would rank second with its value of slightly over one million dollars.

Finally, it must be remembered that these values and costs may differ from the final appraised rates. They are used here to provide an economic basis for comparing the alternatives. Due to better-than-average current timber values, the return to the government is expected to be higher than shown here.

Table 4-16. Combined Cable and Helicopter Timber Values and Costs to an Operator of Average Efficiency.

TOTAL CABLE & HELI	Alt 1	Alt 2	Alt 3	Alt 3a	Alt 4
VOLUME HARVESTED (MBF)					
Cable	0	28,000	22,000	21,000	17,000
Helicopter	0	12,000	12,000	5,000	12,000
Total	0	40,000	34,000	26,000	29,000
VALUE (Thousand \$) (Possible Return to Government)					
Cable	NA	952	462	567	204
Helicopter	NA	1092	1092	455	1092
Total	NA	2044	1564	1022	1296
DOLLARS per MBF	NA	43	34	39	30

Employment

The number and value of jobs provided by the harvesting and processing of timber on the Frosty area is based on the following assumptions:

1. Seven jobs are generated per million board feet of timber harvest.
2. The value of each job is \$23,000 per year.
3. The secondary benefit of dollar return to communities is a seven-to-one ratio of the direct job value.

Alternative 2 would generate the most jobs, followed by Alternatives 3 and 4 (see Table 4-17). Alternative 3a would generate the fewest jobs.

Table 4-17. Number and Value of Jobs Generated by a Frosty Area Timber Sale.

Job Factor	Alt. 1	Alt. 2	Alt. 3	Alt. 3a	Alt. 4
Number Jobs Generated	0	280	238	182	203
Dollar Value (million \$)	0	6.44	5.47	4.19	4.65
Secondary Dollar Value (million \$)	0	45.08	38.29	29.30	32.69

***Cumulative
Effects***

Selection of one of the action alternatives would contribute to the continued viability of the timber industry in southeast Alaska and the continued socio-economic stability of southeast Alaska communities. Selection of the no action alternative would not contribute to job or community stability.

Transportation

Forest roads in the Frosty timber sale are classified as either specified or spur roads. The differences are related to the length of service life and the need for control of the road construction process.

Specified Roads

Specified roads serve as the primary transportation link in the sale area. They provide access to each of the harvest units and link the units to the log transfer facility. Following the initial entry described in this Final EIS, specified roads would also be used in future timber harvest entries in 30 to 50 years; for recreation access; and for ongoing silviculture activities such as stocking surveys and precommercial thinning. Their location is specified by the Forest Service.

Spur Roads

Spur roads are road segments that run from the specified road into the harvest units and the sort yard. Following the initial entry, water bars will be installed on spur roads and spur roads will be allowed to grow back, most likely to alder. Feasible spur locations are suggested by the Forest Service but the contractor may choose alternative routes subject to Forest Service approval. Approval is dependent on a location consistent with the same or less impact than the preferred alternative.

The impacts of road construction on the Frosty Study Area are related to the following factors:

1. *The length and location of roads:* Specified roads, while providing access, remove some land from timber production and wildlife habitat. Some erosion can be expected during the time road construction takes place (see section on fish for discussion of consequences). All specified roadbeds will be seeded after use to establish a grass and clover mat to reduce long term erosion impacts and prevent alder growth. These grassed roadbeds will be used by wildlife. Spur roads will be closed by installing water bars and allowing alder to grow over the roadbeds. (See Table 4-18, for mileage differences between alternatives.)
2. *The number of stream crossings and the amount of road constructed near streams:* The construction of culverts and bridges may cause some erosion of sediment into the creeks when and where construction takes place (again, see the section on fish for a discussion of impacts). This will be a short term impact. Culverts will be left in place after harvest is completed. The temporary, portable bridge of the Frosty Creek crossing will be removed and the approaches stabilized before the sale is closed. This will remove easy access to the north side of the stream.
3. *Number and location of rock pits required for construction materials:* Rock pits, like roads, remove lands from timber production and are a long term impact.

Chapter 4 Environmental Consequences

4. *Location of log transfer facility (LTF):* A log transfer facility provides long term access to the area because it is the easiest point of entry not only to timber sale operations but also to future recreation users. Placement of the facility has to consider many factors. The location of the Frosty Bay LTF has already been documented in an environmental assessment and approved in a 1984 decision notice.
5. *Whether or not the road system connects with any other road system:* Because the road system for this and subsequent sales is not planned to be connected to any other road system, extended vehicle use on these roads is not anticipated.

Natural conditions of the landscape will be altered by construction and, depending on the nature of rock sources, may create contrasting soil color. This may be noticeable on roads constructed on the mid-slope of steep ground. Some of the consequences of transportation systems are described for each alternative in Table 4-18.

Table 4-18. Some Consequences of the Transportation System.

	Unit	Alt. 1	Alt. 2	Alt. 3	*Alt 3a*	Alt. 4
Specified Road Construction	mile	0	14.0	14.0	12.2	11.6
Spur Road Construction	mile	0	11.0	7.4	7.1	5.7
Estimated Number of Rock Pits ¹	unit	0	15	13	12	11
Estimated Quantity of Road Rock ²	cubic yards	0	320,000	284,000	254,000	231,000
Log Transfer Facility	unit	0	1	1	1	1
Estimated Quantity of Rock	cubic yards	0	5000	5000	5000	5000
Estimated Land Converted From Natural State by Road and Rockpit Construction ³						
Roads	acres	0	87	87	76	72
Rock Pits	acres	0	7.5	6.5	6.0	5.5
TOTAL	ACRES	0	94.5	93.5	82.0	77.5

¹ Based on 1 rock pit every 1.75 miles of total road system plus 1 for initial starting point

² Based on total road system using 15,000 cubic yards for specified roads and 10,000 cubic yards for spur roads per mile of road

³ Based on an average of 6.2 acres per mile for specified roads and an average rock pit size of 1/2 acre.

Energy Requirements

The amount of energy needed to implement the harvest of timber on each alternative is based on the following assumptions:

1. The rate for timber sale preparation and administration is 0.5 gallon per thousand board feet.
2. The rate for high-lead logging is 2 gallons per thousand board feet.
3. The rate for loading and hauling by truck and for water transport is 8 gallons per thousand board feet.
4. The rate for road construction is 4,000 gallons per mile.
5. The rate for road maintenance is 20 gallons per mile.
6. For the helicopter units, a Bell 214B helicopter would use 160 gallons per hour and would yard 20,000 board feet per hour (8 gallons per thousand board feet).

Table 4-19 shows the energy used for each action alternative:

Table 4-19. Estimated Fuel Consumption for Each Alternative on the Frosty Timber Sale.

Fuel Consumption	Alt. 1	Alt. 2	Alt. 3	*Alt. 3a*	Alt. 4
Thousands of gallons	0	592	515	381	446
Average gallons/mbf	0	14.8	15.1	14.7	15.4

List of Preparers

List of Preparers

Members of the interdisciplinary team (IDT) responsible for conducting the Frosty Study Area analysis and preparing the Environmental Impact Statement are listed alphabetically below:

Richard Aho <i>Fisheries Biologist</i>	B.S. Wildlife, M.S. Fisheries 17 years experience
Donald Carpenter <i>Supervisory Forester Team Leader (Draft EIS)</i>	B.S. Forest Management 17 years experience
Dave Cottrell <i>Supervisory Forester Team Leader (Draft and Final EIS)</i>	B.S. Forest Management, Master of Forestry 24 years experience
Dave Helmick <i>Transportation Planner</i>	22 years experience
Mark Hummel <i>NEPA Coordinator</i>	B.S. Natural Resources, M.S. Natural Resource Policy and Management 3 years experience
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Gall JohnneJack <i>Hydrologist</i>	B.S. Wildland Watershed Management 5 years experience
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John Stevens <i>Forester</i>	B.S. Forestry 13 years experience
Susan Wise <i>Fisheries Biologist</i>	B.S. Zoology 12 years experience

**List of Agencies,
Organizations and
Persons to Whom
Copies of This
Statement were Sent**



List of Agencies, Organizations and Persons to Whom Copies of This Statement Were Sent

The following organizations and individuals are on the mailing list to receive the Final EIS. Number of copies sent are in parenthesis.

Agencies

Alaska Department of Fish and Game, Petersburg (1)
Alaska Division of Governmental Coordination, Juneau (5)
Alaska Department of Natural Resources,
Division of Parks and Outdoor Recreation, Anchorage (1)

Environmental Protection Agency, Seattle (5)
Federal Agency Liaison Division, Washington, D.C. (5)
U.S. Dept. of Commerce, NOAA, Nat. Marine Fisheries Service, Juneau (1)
U.S. Department of Interior, Washington, D.C. (1)
U.S. Fish and Wildlife Service, Juneau (1)
U.S. Forest Service, Ketchikan Area (1)
U.S. Forest Service, Region 10, Juneau (30)
U.S. Forest Service, Washington, D.C. (5)
U.S. Forest Service, Petersburg Ranger District (5)
U.S. Forest Service, Stikine Area Supervisor's Office (20)
U.S. Forest Service, Wrangell (20)

Organizations

Alaska Pulp Corporation, Sitka (1)
Ketchikan Pulp Company, Ketchikan (1)
Klawock Timber Alaska, Inc., Klawock (1)
Mitkof Lumber Company, Petersburg (1)
Olive Cove Homeowners Association, Wrangell (2)
Southeast Alaska Conservation Council (1)
Thoms Place Homeowners Association (1)
Wrangell Chamber of Commerce (1)
Wrangell Fish and Game Advisory Committee (1)

Individuals (1 each)

Rob Bosworth, Juneau
Peter Branson, Wrangell
Raymond Chapman, Meyers Chuck
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Joel and Alice Hanson, Wangell
Edwin Haynes, Meyers Chuck
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Tom Paul, Juneau
Mr. and Mrs. Steve Peavey, Meyers Chuck
Samuel H. Rabung, Wrangell
Barb and Mike Rugo, Wrangell
Mr. and Mrs. Greg Rice, Meyers Chuck
Peter Rice, Ketchikan
Honorable Robin Taylor, Juneau
Harry E. Wilson, Bremerton

Glossary

Glossary

Alaska National Interest Lands Conservation Act (ANILCA)

Passed by Congress in 1980, this legislation designated 14 national wilderness areas in southeast Alaska.

Anadromous

Refers to those fish, usually salmonids, that spawn (some also rear) in freshwater and mature in saltwater.

Aquatic Habitat Management Unit (AHMU)

An area of stream and associated streamside habitat having fish values of such importance that land use activities will be prescribed to meet the management goals for fish habitat.

Buffer Zone

An area surrounding a special feature in order to protect it from development.

eagle nest trees: 330 foot radius around eagle nest trees

cultural sites: as needed

Carrying Capacity

The number of animals that an area can maintain in a healthy condition.

Commercial Forest Land (CFL)

Commercial forest land is land that can produce at least 8,000 board-feet of timber per acre in one hundred years.

Cultural Resource

Any evidence of mankind's activities and behavior; includes data from archeology, architecture, ethnology, and history.

Dispersed Recreation

Outdoor recreation use occurring outside a developed recreation site; includes such activities as scenic driving, hunting, backpacking, and boating.

Estuary

For purpose of this EIS process, estuary refers to the relatively flat, intertidal, and immediate upland areas, generally found at the heads of bays and mouths of streams. They are predominantly mud and grass flats and unforested except for scattered spruce or cottonwood.

Floodplain

The lowland and relatively flat areas joining inland and coastal waters, including debris cones and flood-prone areas of offshore islands, including, at a minimum, that area subject to a 1 percent (100-year recurrence) or greater chance of flooding in any given area.

Inoperable Timber

Timber which is not practical to harvest because of potential resource damages, economic infeasibility, physical limitations or inaccessibility.

Interdisciplinary Team (IDT)

A group of individuals representing different areas of knowledge and skills focusing on the same task, problem, or subject.

Irretrievable Commitment

The production or use of renewable resources that is lost because of allocation decisions. It represents opportunities foregone for the period of time that the resource cannot be used.

Irreversible Commitment

Commitment of resources that are renewable only over a long period of time, such as soil productivity, or to nonrenewable resources, such as cultural resources or minerals.

Land Use Designation (LUD)

The method of classifying land use by the Tongass Land Management Plan. Land uses and activities are grouped together with a set of coordinating policies, an essentially compatible combination of management activities. A brief description of the four classifications follows:

LUD I: Wilderness areas.

LUD II: These lands are to be managed in a roadless state to retain their wildland character, but this designation would permit wildlife and fish habitat improvement, utility corridors, and primitive recreation facility development and roads under special authorization.

LUD III: These lands are to be managed for a variety of uses. The emphasis is on managing for uses and activities in a compatible and complimentary manner to provide the greatest combination of benefits.

LUD IV: These lands will provide opportunities for intensive resource use and development. Emphasis is primarily on commodity or market resources.

Log Transfer Facility (LTF)

A facility located where the road network terminates at saltwater. May be used for a number of transportation purposes. For timber harvesting, the log transfer facility is where logs are bundled and placed into rafts on the water for towing to local mills.

Mass Failures or Mass Movement

The downslope movement of a block or mass of soil. This usually occurs under conditions of high soil moisture, and does not include individual soil particles displaced as surface erosion.

MBF and MMBF

Thousand board feet and million board feet, respectively.

Mining

Includes all operations (prospecting, exploration, development) for the extraction of mineral resources--underground, placer, and open pit mines; rock, and sand and gravel borrow, etc.

Mitigation

Action or actions taken to avoid or minimize negative impacts of a management activity. Includes avoiding an impact altogether by not taking a certain action or part of an action; minimizing an impact by limiting the degree or magnitude of an action and its implementation; rectifying the impact by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or compensating for the impact by replacing or providing substitute resources or environments.

Monitoring

Following a course of events to determine what changes occur as the result of an action.

NEPA

National Environmental Policy Act of 1969.

NFMA

National Forest Management Act of 1976.

Non-Commercial Forest Lands

Lands with more than 10 percent cover of commercial tree species but not qualifying as Commercial Forest Land.

Recreation Opportunity

The availability of real choice for recreationists to participate in a preferred activity within a preferred setting, in order to realize those satisfying recreation experiences which are desired. Recreation opportunities are often described in terms of six classes of opportunity:

Primitive: The most remote, undeveloped, and inaccessible opportunities. Generally includes areas out of sight and sound of human activities and greater than three miles from roads or waterways open to public travel.

Semi-Primitive, Non-Motorized: Limited opportunities for isolation from the sights and sounds of humans, and a high degree of teneration with the natural environment. Generally includes those areas greater than 1/2 mile and less than three miles from waterways, with roads and trails open to motorized use.

Semi-Primitive, Motorized: Predominantly unmodified natural environment with minimum evidence of sights and sounds of humans with primitive roads and trails open to motorized use. Generally includes areas less than 1/2 mile from waterways. Roads are not maintained.

Roaded, Natural: Predominantly natural environments with moderate evidence of sights and sounds of humans. Includes areas less than 1/2 mile from roads open to public travel, railroads, waterways, major powerlines and within resource modification areas.

Rural: Includes those areas within small communities, developed campgrounds, developed ski areas, and administrative sites. Modifications are primarily to enhance specific recreation activities. Sights and sounds of humans are readily evident.

Modern-Urban: Substantially urbanized environments, although the background may have elements of a natural environment. Renewable resource modifications and utilization practices are common. Vegetative cover is often exotic and manicured. Sights and sounds of humans are predominant.

Resident Fish

Fish which are not anadromous and which reside in fresh water on a permanent basis. Resident fish include non-anadromous Dolly Varden char and cutthroat and rainbow trout.

Riparian Ecosystems

Includes wetlands, streams and lakes, and those areas around streams and lakes which can influence the aquatic environment.

Rotation

The planned number of years between the formation of regeneration of a stand and its final cutting at a specified stage of maturity.

Sedimentation

Addition of fine organic or inorganic material to a stream channel. Usually that portion remaining in the streambed gravel.

Sensitivity Levels

A measure of viewer interest in scenic quality of the landscape as seen from roads, trails, waterways or other travel routes and from facilities or other areas of the national forest that have significant public use. Level 1 has the highest sensitivity, level 3, the lowest.

Temperature-Sensitive Stream

Those streams flowing out of lakes or muskegs, or for some other reason susceptible to warming beyond a tolerable level for fish.

VCU - Value Comparison Unit

A distinct geographic area that generally encompasses a drainage basin containing one or more large stream systems. Boundaries usually follow easily recognizable watershed divides. These units were established to provide a common set of areas for which resource inventories could be conducted and resource values interpretations made.

Visual Quality Objectives (VQO's)

VQOs are standards for visual quality which reflect the varying degrees to which the landscape may be modified. The standards are based upon viewing distance, the character of the natural landscape, and the public's concern for scenic quality. "Inventory" VQO's have not yet undergone trade-off analysis relative to other resources. "Adopted" VQO's reflect analysis involving other resources and become management direction in a selected and approved land management alternative. The five visual quality management objectives are:

Preservation - Allows only ecological changes. Management activities, except for very low visual impact recreation facilities, are prohibited.

Retention - Provides for management activities which are not visually evident. Management activities are permitted but the results of those activities on the natural landscape must not be evident to the average viewer.

Partial Retention - Management activities may be evident to the viewer, but must remain visually subordinate to the surrounding landscapes.

Modification - Management activities may visually dominate the original surrounding landscape but must borrow from naturally established form, line, color, and texture.

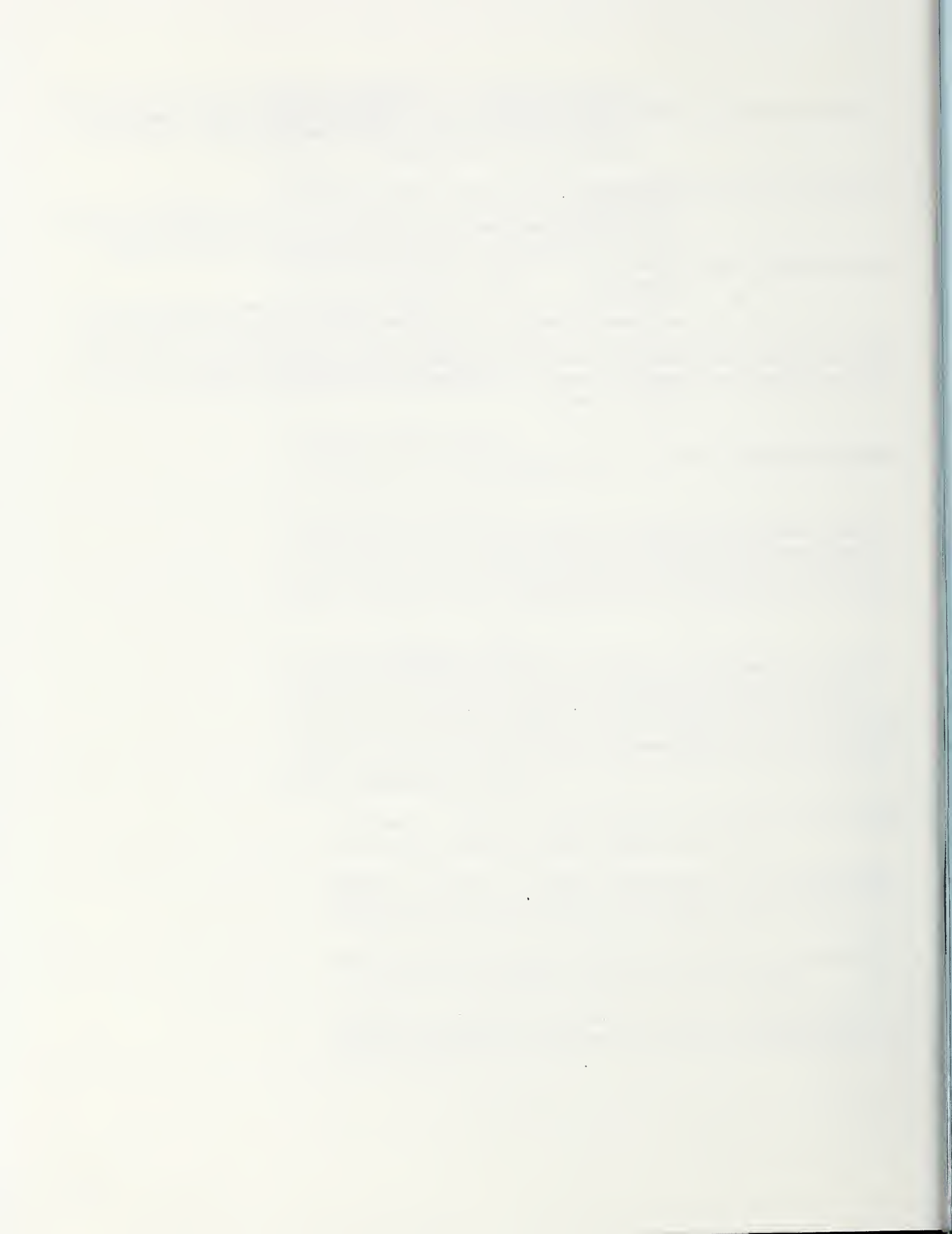
Maximum Modification - Land management activities can dominate the natural landscape to a greater extent than in the modification objective except as viewed from background when visual characteristics must be those of natural occurrences within the surrounding area.

Wetlands

Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Winter Range

Areas used by animals from December through March, when many sources of food are covered with snow. For deer, winter range is generally found below 1200 feet elevation on north-facing slopes and below 1500 feet elevation on all other slopes. During severe winters, the greatest number of deer can be supported by high-volume, old-growth stands on south-facing slopes, below 500 feet elevation and within 1/4 mile of salt water.



Index

Index

Alaska Coastal Management Program	5
Alaska Department of Environmental Conservation	5
Alaska Department of Fish and Game	4, 47
Alaska Department of Natural Resources	5
Alaska National Interest Lands Conservation Act (ANILCA)	1, 45, 72
Alternatives not considered in detail.	8
Alternatives considered in detail	12
Anchorage (Frosty Bay)	4, 7, 8, 14, 16, 18, 20, 47, 73
Bald eagles	44, 70
Black bear	4, 25, 44, 46, 69
Cultural resources	48, 74
Decisions to be made	2
Department of the Army, Corps of Engineers	5
Eagles	4, 25, 43, 70
Economics	26, 81, 83
Employment	26, 55, 83
Endangered/threatened species	66
Environmental Protection Agency	5
Federal and State permits and licenses	5
Fish	4, 24, 35, 46, 64
Forest Plan	2, 9, 48, 80
Hunting and Trapping	47, 72
Issues	3
Log transfer facility	2, 5, 85, AP-7
Mailing list	89
Marten	4, 25, 42, 68
Minerals	52, 79
Mitigation	10
Monitoring	4, 11
Opportunities	4
Over-size timber units	14, 16, 18, 29, 22, 23, 28
Preferred alternative	9
Public involvement	3

Recreation	4, 47, 73
Retention (wildlife habitat)	38, 66, 67, AP-171
Roads	23, 55, 62, 63, 74, 84, 85, AP-11, AP-87
Rock pits	85, AP-87
Sitka black-tailed deer	4, 24, 40, 41, 46, 66
Soils	31, 33, 61
Subsistence	25, 45, 71
Threatened/endangered species	39, 66
Timber	9, 14, 16, 18, 20, 22, 23, 52, 53, 54, 61, 63, 80, 81, AP-17
Tongass Land Management Plan (Forest Plan).	2, 9, 48, 80
Tongass Land Management Plan Revision	48, 56, AP-171
Trapping and hunting	47, 72
Transportation	23, 55, 62, 63, 74, 84, 85, AP-11, AP-87
Vancouver Canada Goose	4, 25, 42, 43, 69
Visual resources	3, 26, 49, 75,
Watershed	24, 29, 59, 61, AP-13
Wetlands and floodplains	32, 62
Wildlife	4, 38, 66, AP-171
Wildlife habitat retention	38, 66, 65, AP-171
Wild and scenic rivers	48, 74

Appendices

APPENDICES

- Appendix A: Decision Notice, Cleveland Timber Sale**
- Appendix B: Decision Notice, Log Transfer Facility**
- Appendix C: Road Management Objectives**
- Appendix D: Stream Channel Process Groups**
- Appendix E: Unit Descriptions**
- Appendix F: Road Descriptions**
- Appendix G: Comments on Draft EIS and Forest Service
Response**
- Appendix I: Wildlife Habitat Retention in the Preferred
Alternative of the Draft Forest Plan Revision**
- Appendix J: Potential Sale Area Improvement Projects**

Appendix A

Decision Notice Cleveland Timber Sale

Decision Notice
and
Finding of No Significant Impact

Cleveland Timber Sale
Wrangell Ranger District
Tongass National Forest, Stikine Area
Alaska

An Environmental Assessment discussing the proposed Cleveland Timber Sale is available for public review in the Forest Service District Office in Wrangell and the Supervisor's Office in Petersburg, Alaska.

The study was conducted in accord with the Alaska Regional Guide and the management direction and emphasis of the Tongass Land Management Plan and Management Area Analysis.

The proposed sale is located on the Cleveland Peninsula along the Seward Passage of Ernest Sound. The activity is within the Frosty Value Comparison Unit (VCL 524) as identified in the Tongass Land Management Plan.

The alternatives considered included a No-Action alternative and four alternatives that ranged from an estimated 26 MMBF to 41 MMBF of sawlog volume to be harvested.

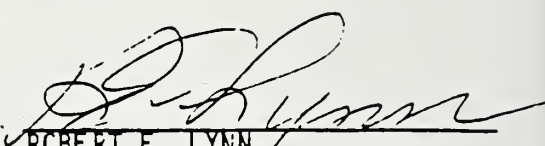
Based upon the analysis and evaluation described in the Environmental Assessment, it is my decision to proceed with Alternative D which proposes to harvest an estimated 31 MMBF of sawtimber by cable systems. Logs will be hauled to a Terminal Transportation Facility in Frosty Bay for transfer to saltwater. Approximately 14 miles of specified road will be constructed.

Alternative D, with standard mitigation measures to stabilize exposed soils and prescriptions to artificially regenerate harvested areas if necessary, provides the best combination of physical, biological, and economic benefits and is the Forest Service preferred alternative. Three of the 19 proposed cutting units are not expected to meet the assigned Visual Quality Objectives until the new trees are established. These harvest areas will be visible from Ernest Sound and Seward Passage. Six of the 19 proposed cutting units would exceed 100 acres but be less than 150 acres in size. The designation of these cutting units is in conformance with the Alaska Regional Guide.

I have determined through the environmental analysis that this is not a major Federal action that would significantly affect the quality of the human environment; therefore, an Environmental Impact Statement is not needed. This determination was made considering that the project: (a) conforms to Federal laws, Forest Service policy, and relevant State laws; (b) conforms with the Tongass Land Management Plan and the Stikine Area 5-year Timber Action Plan; (c) affects no known threatened or endangered plants or animals; (d) is consistent with the Alaska Coastal Management Program, and (e) will not significantly affect subsistence use or resources in the area.

This decision is scheduled to be implemented by offering the timber for sale in 1986 and is subject to administrative review (appeal) pursuant to 36 CFR 211.18.

10/24/84
Date


ROBERT E. LYNN

Forest Supervisor

Box 309

Petersburg, AK 9983

Appendix B

Decision Notice Log Transfer Facility

DECISION NOTICE AND
FINDING OF NO SIGNIFICANT IMPACT
FROSTY BAY TERMINAL TRANSPORTATION FACILITY

USDA Forest Service
Tongass National Forest

An Environmental Assessment that discusses construction of a terminal transportation facility (TTF) at Frosty Bay is available for public review at the Wrangell Ranger District Office in Wrangell, and the Stikine Area Supervisor's office in Petersburg, Alaska.

The Wrangell Ranger District, Stikine Area, Tongass National Forest, proposes to construct this facility located on the mainland approximately 32 air miles southeast of Wrangell, Alaska.

The analysis process was a systematic, interdisciplinary team (IDT) approach in accordance with the National Environmental Policy Act (NEPA) and the management direction of the Tongass Land Management Plan.

Four alternative locations were considered. Two were on either side of Frosty Bay near the mouth. A third was in the small bay just outside and to the south of Frosty Bay. The fourth was along Seward Passage approximately 1 mile south of Frosty Bay.

Three alternative types of facilities were considered for each location. These were a bulkhead, a conveyor, and a ramp.

Based on the analysis, the evaluation described in the Environmental Assessment, and other data, it is my decision:

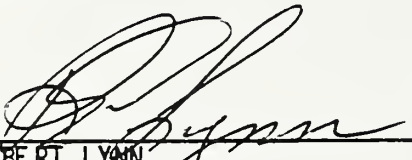
1. To construct a TTF at Site 2 located on the south shore of Frosty bay near the mouth of the bay.
2. To build a temporary log crib bulkhead which would accommodate an A-frame, gantry, crane, or other similar devise capable of lifting logs into the water.

The Environmental Assessment indicated the TTF should be constructed at Site 2, and that a permanent conveyor should be built at this location. The analysis was based on an estimate of approximately 100 MMBF of operable timber tributary to the TTF. Subsequent timber inventories have reduced the estimate to approximately 50 MMBF. A majority of the normal operable volume will be harvested during the initial timber sale. The small amount of remaining volume, which may be harvested with small sales, does not constitute a long-term need for a permanent conveyor; I have therefore, selected a temporary log bulkhead to satisfy the needs for the initial timber sale.

I have determined through the Environmental Assessment that this is not a major federal action that would significantly affect the quality of the human environment; therefore, an Environmental Impact Statement is not needed.

This facility is scheduled to be constructed in conjunction with the Cleveland Timber Sale which will be offered for sale in 1986. The TTF will likely be built in 1987.

This decision is subject to administrative review (appeal) pursuant to 36 CFR 211.18.



ROBERT LYNN
Forest Supervisor



Date

Frosty Bay LTF description: Construct a shot rock filled log cribbed bulkhead transfer facility requiring 1,600 cubic yards of fill that would measure 190' wide at the front of the bulkhead, install an A-frame or crane, and construct a 500' X 1,056' log boom rafting area with a 30' X 50' log gear raft moored to a boom to aid in the harvest and transport of timber.

Monitoring:

COE -- That the applicant must obtain Environmental Protection Agency National Pollutant Discharge Elimination System authorization prior to operating the log transfer facility.

EPA -- In compliance with the provisions of the Federal Water Pollution Control Act, as amended (33USC, Section 1251 et seq.: the "Act"), United States Forest Service, is authorized to discharge logs and bark associated with a log transfer facility to Frosty Bay, (Seward Passage) in accordance with the General Discharge Limitations, Best Management Practices, monitoring and reporting requirements, and other conditions set forth herein (SEE PERMIT FOLDER FOR COMPLETE PERMIT [18 PAGES]). This permit shall become affective on June 27, 1986. This permit and the authorization to discharge shall expire at midnight, June 27, 1991.

ADGC -- 1. No fill shall be placed nor drilling occur below the extreme high tide line during the period April 1 through May 31.

2. Fill shall be placed only during low tide or when fill areas are dewatered.

3. Blasting shall not be permitted during the periods April 1 through May 31 and July 15 through September 1.

4. Blasting shall be conducted when the tidal stage is at or preferably below the zero tideline.

5. Blasting shall be conducted to preclude overpressure in adjacent waters from exceeding 2 pounds per square inch (psi).

6. A double A-frame or crane shall be used to preclude violent entry of logs into marine waters.

7. Logs shall be stored in water no less than 40 feet in depth at mean low water.

ADL -- This easement shall be for a term of 15 years (dec. 15, 2000), unless abandoned by the Grantee, terminated by the Grantor for cause, or terminated by mutual agreement between the Grantor and the Grantee. For the purpose of termination, "cause" is defined as a breach of any condition of the Grant, which the Grantee fails to correct within thirty (30) days written notice served upon the Grantee at its address of record. Abandonment is defined as the unexcused failure of the Grantee to use the easement for its intended purposes for a period of one year.

Appendix C

Road Management Objectives

ROAD MANAGEMENT OBJECTIVES

All proposed roads in the Frosty Timber Sale area would be located on lands with a Tongass Land Management Plan land use designation of IV. This land use designation allows opportunities for intensive resource use and development where emphasis is primarily on commodity or market resources.

Due to the lack of public access and the absence of developed communities, future forest development roads (also known as permanent, system and specified roads) will primarily be managed for timber resource management. Timber resource management includes but is not limited to: logging, Forest Service administration, and thinning. Access to fish and wildlife enhancement projects, as well as some recreational use of the roads by motor bikes, mountain bikes, or by foot may be provided by the road system.

Traffic will consist of logging traffic (trucks, low-boys, mobile-yarders and other logging related vehicles), Forest Service administrative traffic (pick-ups, crew rigs, etc.), and other forest contract work (thinners, fish pass construction, etc.). Some of these vehicles will be used for recreational use but the current seasonal average daily traffic generated for recreational use is estimated to be less than one vehicle per day. No increase in recreational traffic is expected within the foreseeable future.

All Forest development roads within the Frosty Timber Sale area will have a long-term service life designation. These roads so identified will be developed and operated for long-term land management and resource utilization needs.

There are three functional levels of service applicable to long-term service roads: arterial, collector and local. Arterial roads serve large land areas and provide for maximum ability for travel efficiency. Collector roads serve to collect traffic from local roads and provide both multiple purpose needs as well as travel efficiency. Local roads serve a specific resource activity usually one principal purpose for being open or operated even though minor uses exist (i.e. logging unit).

Long-term roads are also managed by their predicted cycle of entry. There are two standard cycles of entry: constant and intermittent. If the road is located in the network as to have continuous or annual recurrent use it is a constant service road. An intermittent service road is only needed for occasional use and is not used for periods that exceed one year. All Frosty Timber Sale roads are classified as intermittent service roads. Intermittent service roads are restricted to one user group (logging and Forest administrative traffic) at a time to avoid safety problems or changes in maintenance cost shares. These roads are restricted to high clearance vehicles requiring special driver skills. Intermittent service roads when not in use, will not be closed by pulling culverts, water barring or barricading the entrances.

Since all Forest development roads in the Frosty Timber Sale area will be restricted to high clearance vehicles and/or user groups, these roads will not be subject to the Highway Safety Act.

Frosty Timber Sale roads will be maintained to provide: road investment protection, adjacent environment and resource protection, operational status and user safety. Intermittent service roads will be maintained at maintenance level 3 when logging operations are in progress. They will be maintained at maintenance level 1 when not in use. This level requires basic custodial maintenance be performed to protect the road investment and to keep damage to adjacent resources to an acceptable level. Drainage facilities will be maintained.

Appendix D

Stream Channel Process Groups

STREAM CHANNEL PROCESS GROUPS

The term "process group" refers to a group of stream channels that were all formed by the same geologic processes. This appendix describes nine different process groups, lists the stream channel types in each group, and explains some of the management implications of each group.

Floodplain Stream Channels

These are channels (designated as B1, C1, C3, C4, and C6 channel types in the process group delineation in Draft F of the Tongass Land Management Plan revision) with active floodplain development. Floodplain channels have a two-way interaction between the stream channel and the floodplain area through bank erosion, channel migration and overflow, leaf fall, and blowdown/tree fall. Alluvial channels process energy for the stream and are an important source of nutrients. Flooding is a fundamental process in alluvial channels. The riparian zone is usually very broad and adjacent upland plants do not directly influence the riparian areas.

The riparian areas are extremely dynamic because streamflows within alluvial or uncontained areas are generally poorly contained and flood during seasonal or individual storms. Stream channel banks consists of unconsolidated materials, either alluvial sands, gravels or organic material. Channel migration and braiding of the stream channels occurs with varying frequency, depending on bank and bed stability. The bed and bank stability are usually tied to the adjacent plants. Trees and shrubs are very important to controlling the stability of the streambanks, as their root network often is the only thing holding together the unconsolidated alluvial streambank soil. Large Organic Debris (LOD) plays an important role in controlling the stability of the stream bed and banks by regulating the stream's energy dissipation. Habitat forms in the pool riffles caused by the energy dissipation. The riparian area adjacent to the alluvial channels encompasses the channel banks, active channel floodplain, sloughs, backwater overflow channels, and ponded swales. Because of the interactions of the stream with the adjacent landform, the alluvial channels contain a richer, more abundant community of fish than found in contained stream channels.

Channels on the Alluvial Fans

These channels (designated as A3 and B5 in the process group delineation in Draft F of the Tongass Land Management Plan revision) are transitional, being streams that are dominated by both sediment transport and sediment deposition. High energy streamflows of low to moderate magnitude are delivered to fans from their upstream contained drainage basins. Flood flows which occur episodically are a result of flash floods or debris torrents delivering high volumes of sediment which are quickly deposited on the streambed, streambanks, and areas adjacent to the stream. Stream channel migration or abandonment often occurs during these events. The stream channels are numerous and are generally found throughout the fan area. Many of the channels are ephemeral.

The rearing and spawning habitat value of fan channel types for salmon and trout varies from high or low. The channels are unstable, and sometimes intermittent during low streamflow periods in the summer and winter months, thereby limiting their use for rearing coho salmon and resident trout. The gravel beds are unstable due to the high energy flows and the large amounts of coarse gravels moving through the fan channels, so successful spawning is limited. However, on the toe end, or lower gradient portions of the fans, the value is higher for spawning and rearing for coho and pink salmon. Where abundant LOD is present, the value for coho salmon can be moderate to high. The toe ends are also characterized by more stable gravel beds, thereby increasing spawning value.

**Channels with "Mixed"
or Colluvial Control**

As the name implies, these channels (designated as B2 and B3 channels in the process group delineation in Draft F of the Tongass Land Management Plan revision) are a mixture of stream channel containment. Some segments are controlled by bedrock or the valley walls, while other areas have minor floodplains. Within these moderate gradient channel types, the bedrock segments of the channel act as sediment transport systems, while bed materials are deposited in the lower gradient and floodplain development is apparent.

The habitat capability and sensitivity of these channels to disturbances caused by management is midway between floodplain and contained channels. The importance of the interaction between the stream channel and riparian vegetation is intermediate. Much of the better rearing habitat, particularly the coho salmon winter refuge habitat, is associated with LOD accumulations in the stream. Within "mixed" channel types microhabitats that provide winter refuge may be even more important than in the alluvial streams.

**Low Gradient
Contained Channels**

These are streams (designated as C2, C5 channel types in the process group delineation in Draft F of the Tongass Land Management Plan revision) where the channel is contained by the adjacent landform with the channel having little effect on that landform. The adjacent influence zone often extends to the slope break above the incised valley slope. The width of the zone of influence on the aquatic habitat is dependent upon the adjacent upland soils and vegetation (primarily trees). The adjacent vegetation plays a major role in controlling the rate of downslope movement of soil into the stream channels, as well as providing energy dissipation structures in the stream channels to trap and store sediment that is being transported downstream.

The lower gradient channels contain habitat for large numbers of spawning pink salmon, particularly in the lower segments where large accumulations of suitable sized spawning substrates exist. Rearing habitat, particularly winter refuge habitat, is limited to sections of the stream where large quantities of LOD have accumulated in the stream.

**Moderate Gradient
Contained Channels**

These channels (designated as B4 and B6 channel types in the process group delineation in Draft F of the Tongass Land Management Plan revision) are also contained by the adjacent landform, with moderate instream gradients. Stream energy, substrates, and run-off are effectively contained by landform or streambank features. When the adjacent sideslopes are short, low gradient, or absent the influence zone is narrow. This group can have streams with very large, high gradient sideslopes which correspond to large areas that influence stream conditions. These streams are very much influenced by the highly sensitive natures of these sideslopes.

The moderate gradient channels contain limited amounts of anadromous fish habitat. When access is available, spawning habitat is limited due to lack of suitable sized substrates. Rearing habitat is limited to summer habitat for coho and steelhead trout. Moderate gradient contained channels usually provide moderate resident fish rearing potential.

**High Gradient
Contained Channels**

These channels (designated as A1, A2, A4, A5, A6, A7 and B7 channel types in the process group delineation in Draft F of the Tongass Land Management Plan revision) are source streams for downstream waters and transport organic and inorganic sediments to the downstream habitats. The stream channels are well contained within the narrow valley bottoms. Channel banks are steep and generally composed

of large material, either consolidated bedrock or well packed boulders, rubble, and cobbles. The riparian vegetation along currant brush communities. The channels are predominately influenced by the upland or terrestrial plant communities. Soils in the adjacent upland area are often shallow and subject to downslope movement. Leaves, forest litter, and trees often move downslope into these incised channels when disturbance occurs.

High gradient contained streams generally do not produce anadromous fish, as numerous waterfalls and cascades prevent access. The lack of high quality rearing pools limits the production of resident fish.

Glide Streams

These channels (designated as L1 and L2 in the process group delineation in Draft F of the Tongass Land Management Plan revision) occur throughout the watershed on gently sloping lowlands landforms and are frequently associated with bogs and marshes, or lakes. Because of the low gradient, most of the sediment being transported in the stream channels is sand sized or smaller, and much of it settles out in the gently gradient channels. Though the channels are shallowly incised, and have fair flow containment, flood flows usually overtop the streambanks and flow onto the adjacent landform, lessening downstream flooding and serving as a buffer during major storms. Low gradient, slow flowing streams are often associated with temperature sensitive watersheds. The lower banks are composed of material that erodes easily. Productivity of the channel is moderately tied to the riparian/terrestrial interaction. The bank trees control the channel stability in the floodplain control areas.

Glide streams have moderate to high capability for coho salmon. Spawning gravels are not abundant, but are usually sufficient to fully seed the available habitat. The channels provide summer coho rearing habitat, but usually more limited "overwinter" habitat, due to the lack of abundant large complex pools that provide quality winter refuge. C7 channels that form the outlet channels of lakes do provide good overwinter habitat due to the temperature moderation of the upstream lake waters. The better rearing habitat, particularly winter refuge habitat is tied to undercut banks and LOD controls the long term maintenance of much of the rearing and spawning habitat. The channels are frequently used by pink salmon for spawning.

Estuarine Stream Channels

These channels (designated as E1, E2, E3 and E5 channels in the process group delineation in Draft F of the Tongass Land Management Plan revision) occur at the mouths of watersheds within estuarine landforms. The single to multiple channels are shallowly incised with fair to poor flow containment and are characterized by small alluvial material. The various channel types within the estuarine group are differentiated by channel substrate size. Sediments produced from the watershed are ultimately deposited in the estuarine channels. Consequently, they are highly sensitive to upstream management activities.

The streambanks and channel beds are composed of loose, fine textured material which are easily eroded. As a result, bank widths and depths are highly variable and bank and channel beds are stable. Sedge and marshland plants dominate the streamside and the interaction between the upland plants and the stream environment is minor. Stream migration and braiding varies, depending largely on bank and bed stability. The bed stability is critical for the production of pink salmon fry from the estuarine areas. Where the streams are excellent producers of pink salmon. These channels provide important rearing habitat for most species.

Lakes and Ponds

These types (designated as L, L3, L4 and L5 channels in the process group delineation in Draft F of the Tongass Land Management Plan revision) consist of lakes and ponds (including most beaver ponds). Lakes contain valuable aquatic habitat for some fish species, primarily sockeye and coho salmon, and trout.

Appendix E

Unit Descriptions



UNIT DESCRIPTIONS

The following is a capsulation of the IDT analysis of each of the units proposed in the preferred alternative, Alternative 3A. This is different than Alternative #3 shown in the Draft EIS because further analysis has required changes for specific mitigation measures and resource concerns. These descriptions are not "unit cards," but the results of the IDT analysis of those cards at this point in time. The unit cards are part of the planning file and can be seen in that file. They will continue to be used through the layout and harvest of units and the survey and construction of roads described in the Forest Service Manual.

It has to be anticipated that there will be some minor changes to the units as depicted on these descriptions. It is virtually impossible, without field verification of every unit boundary, to not have some changes. Exact conformance to preset lines, regardless of values, would not be proper management. Opportunities to not only protect newly discovered situations but also to optimize management intent without changing the environmental impacts have to be anticipated and instituted. The resources, as they are now known and analyzed, have been protected or enhanced to the greatest extent practicable.

If changes and impacts develop which are outside the scope of the impacts envisioned with this Final EIS, additional documentation may be required.

In the review of the unit descriptions, specific mitigation measures are shown and these should be self-explanatory. A few items that may require clarification are described below:

Suspension/Logging Requirements:

- Full: Logs have to be fully suspended when yarded. Achieved with helicopter yarding and with cable logging under certain topographic conditions.
- Partial: Only one end of the log touches the ground while being yarded. Normally attainable with cable yarding systems with the location of proper tailholds.
- Cable: Describes high-lead or other similar type equipment. No suspension requirements specified.
- No system listed: Can be yarded with cable or with "shovel" (log loader is used to yard logs)

AHMu Buffer: The need to establish buffer strips for Aquatic Habitat Management Units has been analyzed along all streams. Buffer strips have been established within the guidelines of the Aquatic Habitat Management Handbook. Specific management constraints for buffers can be summarized as follows:

No-cut Buffer: Strip of timber in which no harvest is allowed.

Transition Buffer: Strip of timber in which timber harvest is allowed with specific constraints and objectives. For example, if a 50 foot no-cut buffer is stated, then the 50 foot is the distance from the stream on each side (a buffer of 100 feet in width). If both a 50 foot no-cut buffer and 50 foot transition buffer is stated, then the no-cut buffer is closest to the stream for a 50 foot width on each side, and the 50 foot transition buffer is on the outer edge of the 50 foot no-cut buffer on each side of creek (total buffer width is then 200 feet).

Helicopter units: It is envisioned that all helicopter units will be logged in that manner. However, it has to be anticipated that the purchaser may choose to helicopter some of the high lead units and also may find a suitable method to high lead some of the helicopter units. If the proposed change is outside the scope of this analysis, then a new analysis will be required.

Mobile Yarder: Yarding technique in which the equipment does not need a landing. The equipment moves along the road and yards logs.

Volume Class: The volume of the offered timber sale will be determined by a statistically valid cruise. The volume and volume classes shown in these descriptions resulted from non-statistical field inventories. They are only an indication of volume and the volume of the sale will more than likely be different than what is indicated. To make every alternative "comparable" in the FEIS, the volume for each of the alternatives was determined by multiplying the unit acres in each of the volume classes by the following volumes:

Volume Class 0 (less than 8 mbf/acre):	0 mbf/acre
Volume Class 4 (8-20 mbf/acre):	14.1 mbf/acre
Volume Class 5 (20-30 mbf/acre):	22.4 mbf/acre
Volume Class 6 (30-50 mbf/acre):	34.2 mbf/acre
Volume Class 7 (50+ mbf/acre):	no stands of this class within any of the units

The Volume Class 0, less than 8 mbf/acre, can be an indication of several things:





- 1) low volume stands
- 2) inclusions and rounding of boundaries
- 3) mapping or delineation errors
- 4) photo interpretation errors
- 5) other factors

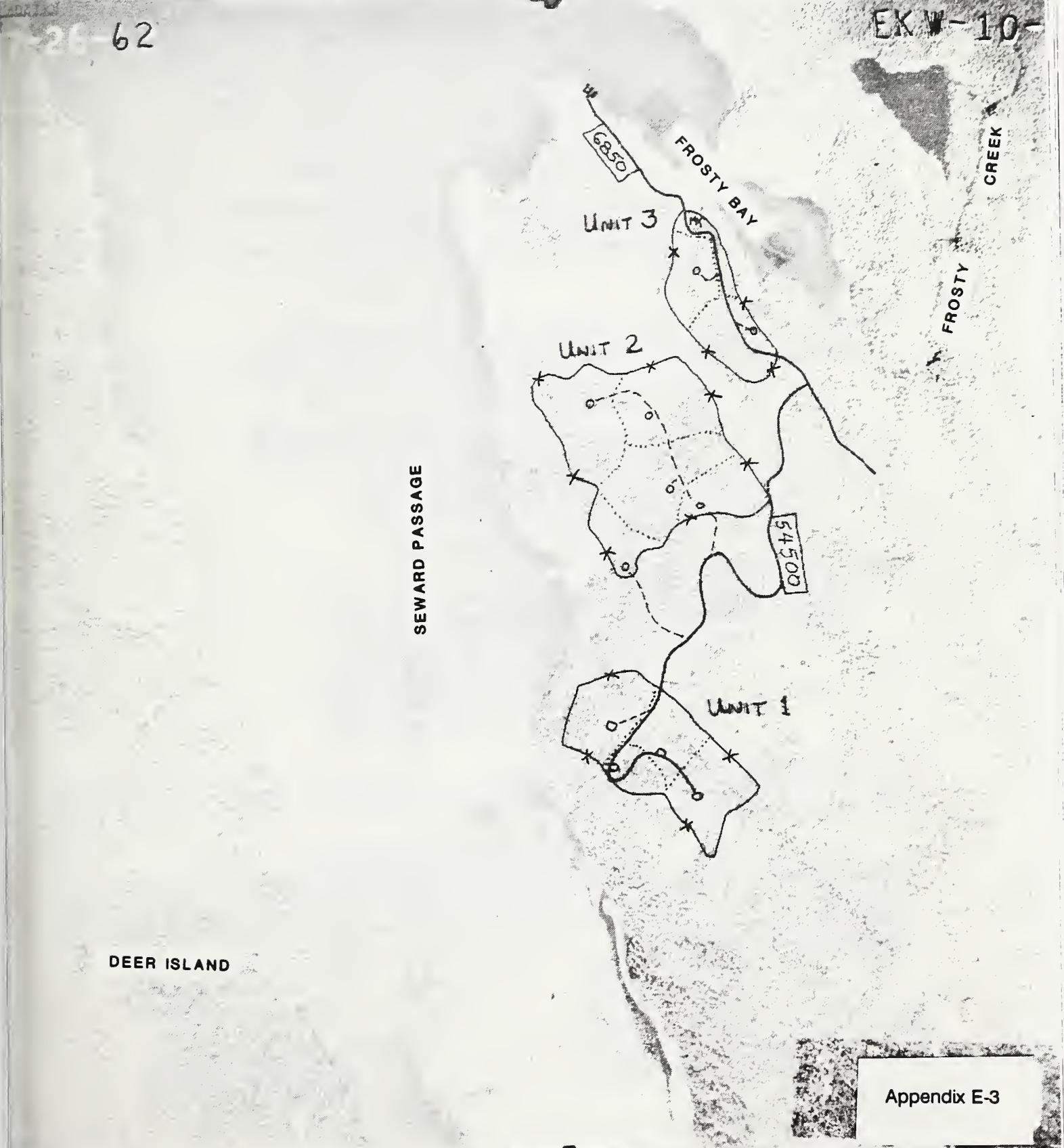
The important thing to remember is that the unit descriptions may not be an exact replication of ground conditions or the results of any subsequent layout efforts.

Units on Aerial Photograph

North is Toward Top of Page

Approximate Scale: 1 Inch = 1320 Feet

	Specified Road		Unit Boundary
	Stream Channels		Setting Boundary Within Unit



UNIT DESCRIPTIONTIMBER SALE: FrostyUnit Number: 1ACRES 50VCU 524Compartment 138Stand 801DEVELOPMENT OF FINAL UNIT BOUNDARY

The unit was included in DEIS alternatives 2 (97 acres) and 3 (53 acres) but was deleted in alternative 4. The unit, as displayed in alternative 3, has essentially been retained. The management and resource concerns were limited to the distance of the unit boundary from the shoreline of Ernest Sound with the corresponding concerns to the wildlife resource along the shoreline, the impacts to the visual resource, and to the creek within the unit. Additional minor adjustments have been made to reduce the acreage within the unit.

RESOURCE CONFLICTS AND MITIGATIONWildlife/Visuals

Conflict: The proximity of the unit to the shoreline would impact both the visual resource and the wildlife values.

Mitigation: Unit was reduced in size and larger leave area established along shoreline.

Stream/Watershed

Conflict: Class III stream may need some protection.

Mitigation: Creek is bedrock controlled and has no fish habitat. No buffer required, partial suspension of logs across creek will be stipulated in contract.

DESCRIPTION OF UNIT ATTRIBUTES/OBJECTIVES

Road Development: (Rounded to nearest 0.1 mile)

0.5 Miles of Specified Road within unit.

0.1 Miles of spur road anticipated.

4 Landings (number)

Timber Attributes:

738 mbf Estimated total volume within the unit

15 mbf Estimated volume per acre for entire unit

Acres by Volume Class within the unit:

46 Volume Class 4 (8-20 mbf/acre)

4 Volume Class 5 (20-30 mbf/acre)

- Volume Class 6 (30-50 mbf/acre)

- Volume Class 7 (50+ mbf/acre)

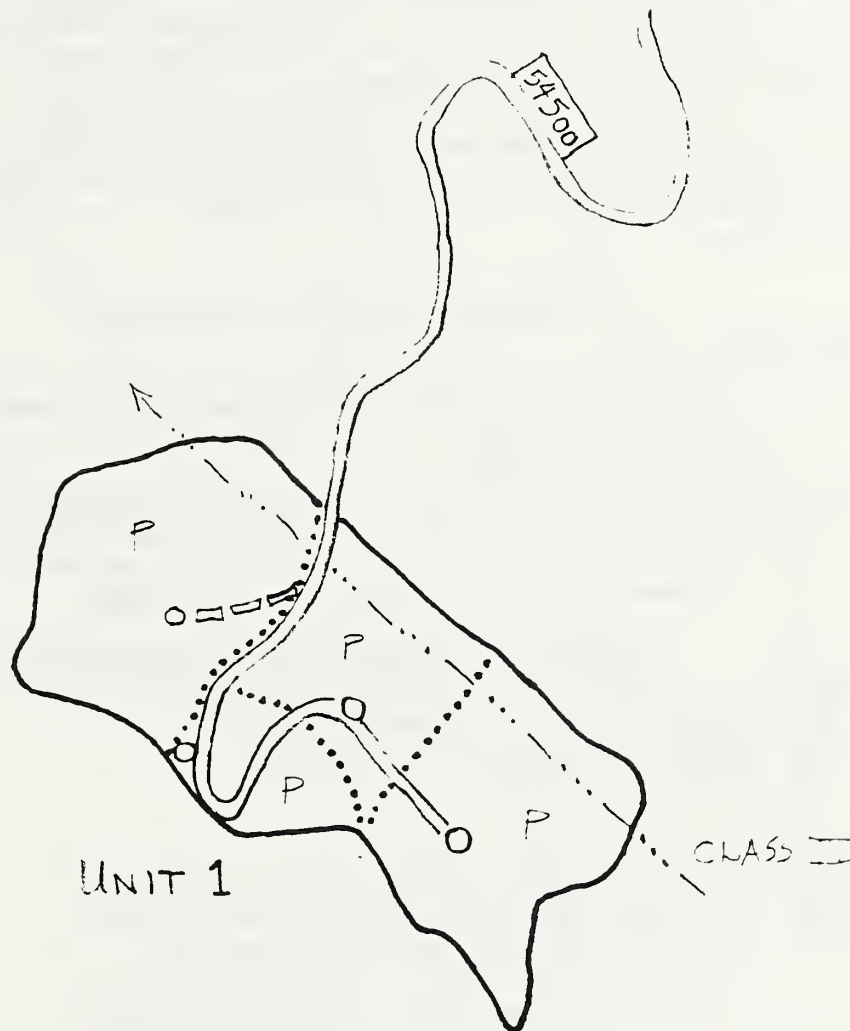
Stand Management Objectives: Even Age Rotation Period: 100 years

Regeneration Method: Natural Anticipated Treatments: Precommercial thinning

Other Timber Considerations: None

PROPOSED ACTION OR DEVELOPMENT

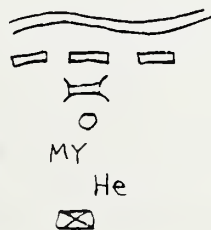
Stand will be highlead yarded. Partial suspension has been specified to reduce impact to the soils. This can be accomplished with high lead yarding systems currently in use. There are no additional protection situations that have been identified or specified.



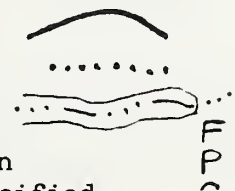
Approximate Drawing Scale: 1" = 660 feet (top of page is north)

Legend:

New Specified Road
 Temporary Road
 Temporary Bridges
 Landings
 Mobile Yarder Settings
 Helicopter Settings
 Helicopter Landing



Unit Boundary
 Setting Boundary
 Stream Buffer
 Full Suspension
 Partial Suspension
 Cable Yarding Specified



UNIT DESCRIPTIONTIMBER SALE: FrostyUnit Number: 2ACRES 81VCU 524Compartment 138Stand 802DEVELOPMENT OF FINAL UNIT BOUNDARY

The unit was included in both DEIS alternatives 2 (93 acres) and 3 (93 acres). It was not included in alternative 4. The management and resource concerns on the unit are similar to Unit 1 and focused on visual impacts and distance from the eagle nests within shoreline leave areas. Changes since the DEIS have been made. Access to the unit will now be from a specified road entering the unit along the south boundary (instead of the north as shown in the DEIS) and the specified road through the unit has been changed to a spur road. Acreage has also been reduced to improve logical settings and to increase the leave strip along Ernest Sound.

RESOURCE CONFLICTS AND MITIGATION

Wildlife/Visuals:

Conflict: In addition to normal wildlife and visual values associated with shoreline areas, there are two eagle nests near the unit and one eagle nest between units 2 and 3 that was near previously proposed specified road.

Mitigation: Shoreline leave area increased and adequate buffer established around eagle trees. Access road from south, instead of north as in DEIS, done to protect eagle nest between units 2 & 3 and to reduce impact to visual resource values.

DESCRIPTION OF UNIT ATTRIBUTES/OBJECTIVES

Road Development: (Rounded to nearest 0.1 mile)

0.0 Miles of Specified Road within unit.0.7 Miles of spur road anticipated.5 Landings (number)

Timber Attributes:

1,632 mbf Estimated total volume within the unit20 mbf Estimated volume per acre for entire unit

Acres by Volume Class within the unit:

22 Volume Class 4 (8-20 mbf/acre)59 Volume Class 5 (20-30 mbf/acre)- Volume Class 6 (30-50 mbf/acre)- Volume Class 7 (50+ mbf/acre)Stand Management Objectives: Even Age Rotation Period: 100 yearsRegeneration Method: Natural Anticipated Treatments: Precommercial ThinningOther Timber Considerations: NonePROPOSED ACTION OR DEVELOPMENT

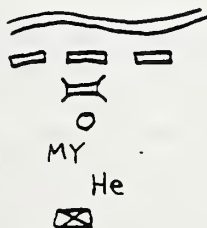
Stand will be highlead yarded. Partial suspension has been specified to reduce impact to the soils. This can be accomplished with high lead yarding systems currently in use. There are no additional protection situations that have been identified or specified.



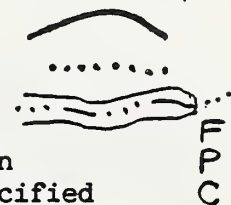
Approximate Drawing Scale: 1" = 660 feet (top of page is north)

Legend:

New Specified Road
 Temporary Road
 Temporary Bridges
 Landings
 Mobile Yarder Settings
 Helicopter Settings
 Helicopter Landing



Unit Boundary
 Setting Boundary
 Stream Buffer
 Full Suspension
 Partial Suspension
 Cable Yarding Specified



UNIT DESCRIPTION

TIMBER SALE: Frosty Unit Number: 3

ACRES 32 VCU 524 Compartment 138 Stand 803

DEVELOPMENT OF FINAL UNIT BOUNDARY

The unit was included in the three action alternatives in the DEIS with the following acreages: alternative 2 (90 acres), 3 (34 acres) and 4 (34 acres). Because of the proximity to Frosty Bay, the visual concerns on this unit were the highest on the sale. Further modifications have been made to this unit and road location within the unit since the DEIS which shifted the road further from the bay and the upper unit boundaries have been shifted down the hill to minimize impacts to the view from Frosty Bay and Ernest Sound. These adjustments have reduced the acreage of the unit. Another consideration is the presence of an archeological site along the bay which has been protected in all DEIS and FEIS alternatives.

RESOURCE CONFLICTS AND MITIGATION

Archeology

Conflict: Archeological site is near this unit.

Mitigation: Leave strip has been established to protect this site.

Visual

Conflict: High visual values associated with view of boats anchored in Frosty Bay and boats traveling in Ernest Sound.

Mitigation: Unit and road location have been modified to further reduce the visual impact.

Recreation

Conflict: Proposed location of administrative/recreation cabin should not be impacted by logging or road construction.

Mitigation: Unit and road location will not impact final cabin site.

DESCRIPTION OF UNIT ATTRIBUTES/OBJECTIVES

Road Development: (Rounded to nearest 0.1 mile)

0.4 Miles of Specified Road within unit.

0.1 Miles of spur road anticipated.

2 Landings (number)

Timber Attributes:

501 mbf Estimated total volume within unit.

16 mbf Estimated volume per acre for entire unit

Acres by Volume Class within the unit:

26 Volume Class 4 (8-20 mbf/acre)

6 Volume Class 5 (20-30 mbf/acre)

- Volume Class 6 (30-50 mbf/acre)

- Volume Class 7 (50+ mbf/acre)

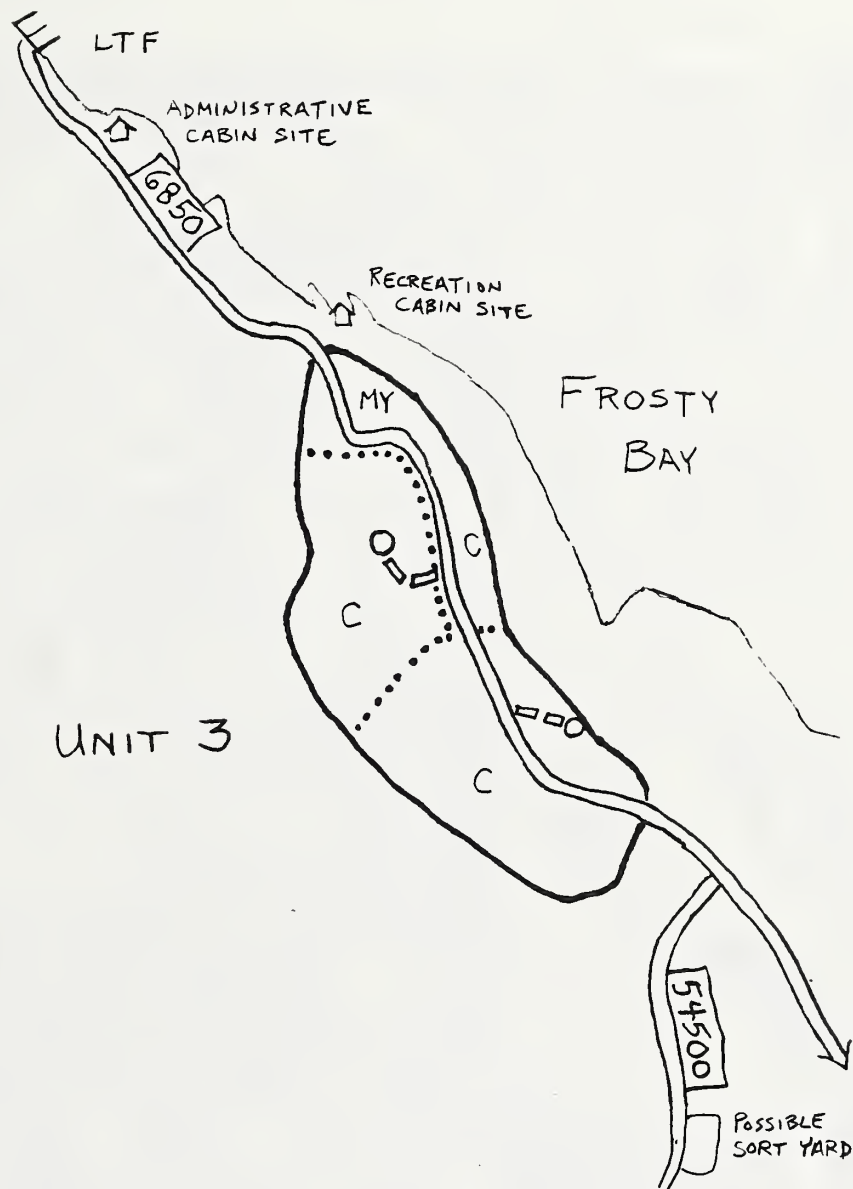
Stand Management Objectives: Even Age Rotation Period: 100 years

Regeneration Method: Natural Anticipated Treatments: Precommercial Thinning

Other Timber Considerations: None

PROPOSED ACTION OR DEVELOPMENT

Stand will be highlead yarded. There are no additional protection situations that have been identified or specified within the unit. Mitigation measures for recreation, visuals, and the protection of the archeological site have reduced unit size. The administrative cabin will initially be located along the road near the LTF site for easy vehicle access. Upon completion of administrative activities, the cabin will be moved to another location near Unit 3 on the beach for recreational boat access.



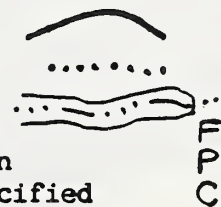
Approximate Drawing Scale: 1" = 660 feet (top of page is north)

Legend:

New Specified Road
 Temporary Road
 Temporary Bridges
 Landings
 Mobile Yarder Settings
 Helicopter Settings
 Helicopter Landing



Unit Boundary
 Setting Boundary
 Stream Buffer
 Full Suspension
 Partial Suspension
 Cable Yarding Specified









Units on Aerial Photograph

North is Toward Top of Page

Approximate Scale: 1 Inch = 1320 Feet

	Specified Road		Unit Boundary
	Stream Channels		Setting Boundary Within Unit



UNIT DESCRIPTIONTIMBER SALE: FrostyUnit Number: 5ACRES 50VCU 524Compartment 138Stand 804DEVELOPMENT OF FINAL UNIT BOUNDARY

The unit was included in all action alternatives in both the DEIS and FEIS, and it has not changed. Resource concerns are limited to the reduction of impact to soils on two of the settings within the final unit boundaries. In anticipation of the need for a sortyard, two muskeg areas adjacent to this unit are considered suitable places for this development. Since the DEIS, the specified road (6850) within the unit has been moved up the hill to reduce impacts. This also provides access to a sortyard location. The junction of the 6850 and 6851 roads occurs within the unit.

RESOURCE CONFLICTS AND MITIGATION

Soils

Conflict: Soils on two of the settings will require some protection.

Mitigation: Partial suspension will be specified to protect soil values.

DESCRIPTION OF UNIT ATTRIBUTES/OBJECTIVES

Road Development: (Rounded to nearest 0.1 mile)

0.6 Miles of Specified Road within unit.0.1 Miles of spur road anticipated.3 Landings (number)

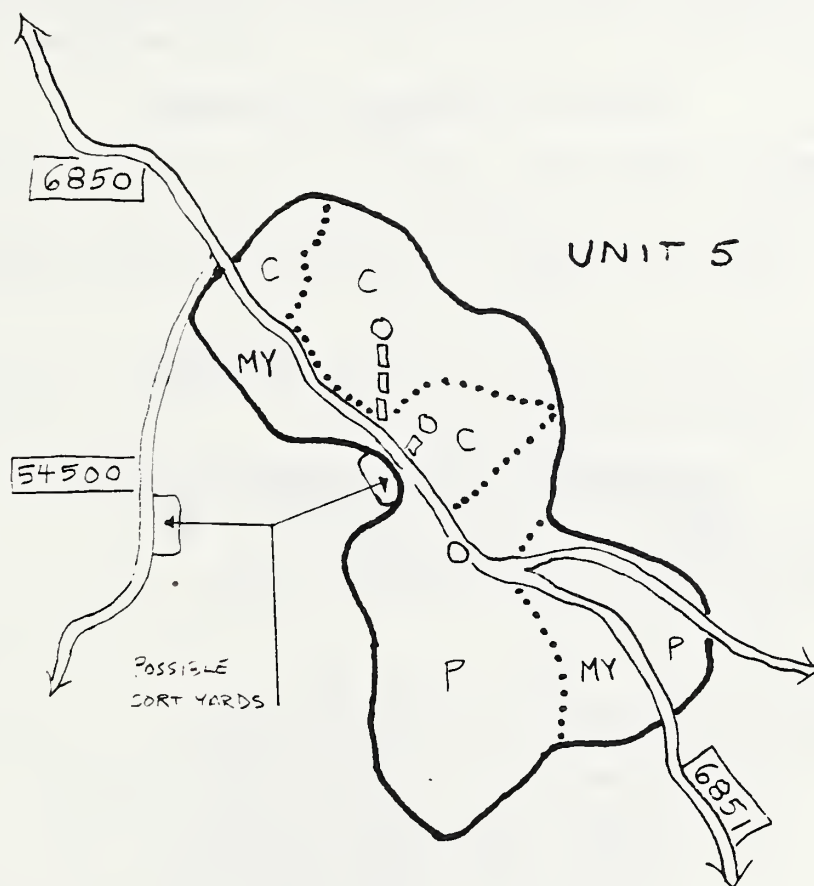
Timber Attributes:

857 mbf Estimated total volume within the unit.17 mbf Estimated volume per acre for entire unit

Acres by Volume Class within the unit:

1 Volume Class 0 (less than 8 mbf/acre)29 Volume Class 4 (8-20 mbf/acre)20 Volume Class 5 (20-30 mbf/acre)- Volume Class 6 (30-50 mbf/acre)- Volume Class 7 (50+ mbf/acre)Stand Management Objectives: Even Age Rotation Period: 100 yearsRegeneration Method: Natural Anticipated Treatments: Precommercial ThinningOther Timber Considerations: NonePROPOSED ACTION OR DEVELOPMENT

Stand will be highlead yarded and two of the settings have partial suspension specified. This requirement can be met with highlead equipment. There are no additional protection situations that have been identified or specified within the unit. The development of a sortyard is possible on a muskeg area adjacent to this unit.



Approximate Drawing Scale: 1" = 660 feet (top of page is north)

Legend:

New Specified Road

Temporary Road

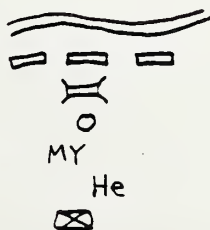
Temporary Bridges

Landings

Mobile Yarder Settings

Helicopter Settings

Helicopter Landing



Unit Boundary

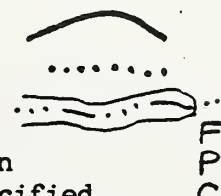
Setting Boundary

Stream Buffer

Full Suspension

Partial Suspension

Cable Yarding Specified



UNIT DESCRIPTIONTIMBER SALE: FrostyUnit Number: 6ACRES 56VCU 524Compartment 138Stand 806DEVELOPMENT OF FINAL UNIT BOUNDARY

The unit was included in all action alternatives in the DEIS with the same acreage (69 acres). Resource concerns are focused around the need to provide adequate protection on the two Class II streams within the unit and possible goose nesting activities. The area outside the unit boundaries on the north side of the unit may be used for the development of a land base camp.

RESOURCE CONFLICTS AND MITIGATIONStream/Watershed

Conflict: Adequate protection is given to the two Class II streams within the unit.

Mitigation: Yarding will be done away from creeks; 50 foot transition buffers will be established. A leave strip has been established on lower reach of one creek adjacent to unit.

Wildlife

Conflict: Need to protect geese during nesting season.

Mitigation: There will be no falling of timber within the unit during the goose nesting period (4/1-6/15).

DESCRIPTION OF UNIT ATTRIBUTES/OBJECTIVES

Road Development: (Rounded to nearest 0.1 mile)

0.4 Miles of Specified Road within unit.

0.4 Miles of spur road anticipated.

6 Landings (number)

Timber Attributes:

550 mbf Estimated total volume within unit

10 mbf Estimated volume per acre for entire unit

Acres by Volume Class within the unit:

17 Volume Class 0 (less than 8 mbf/acre)

39 Volume Class 4 (8-20 mbf/acre)

- Volume Class 5 (20-30 mbf/acre)

- Volume Class 6 (30-50 mbf/acre)

- Volume Class 7 (50+ mbf/acre)

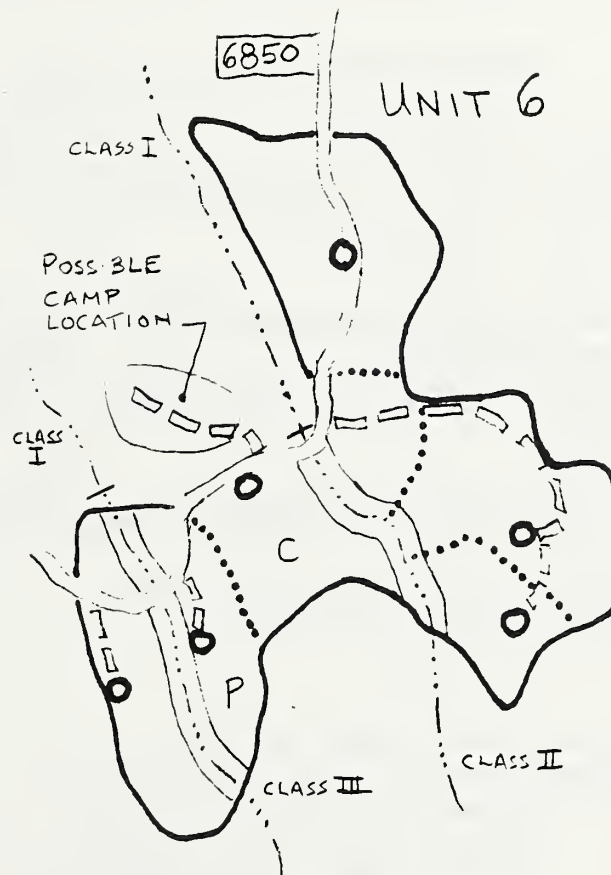
Stand Management Objectives: Even Age Rotation Period: 100 years

Regeneration Method: Natural Anticipated Treatments: Precommercial Thinning

Other Timber Considerations: None

PROPOSED ACTION OR DEVELOPMENT

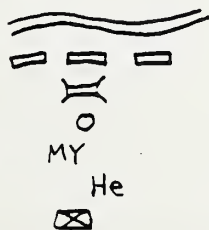
Stand will be highlead yarded and two of the settings have partial suspension specified. The need to provide for AHMU buffers has increased the number of settings. The managed buffer will allow for many of the merchantable trees to be harvested from within the AHMU management unit.



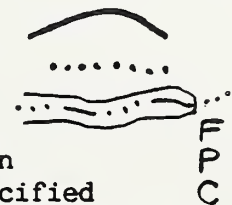
Approximate Drawing Scale: 1" = 660 feet (top of page is north)

Legend:

New Specified Road
 Temporary Road
 Temporary Bridges
 Landings
 Mobile Yarder Settings
 Helicopter Settings
 Helicopter Landing



Unit Boundary
 Setting Boundary
 Stream Buffer
 Full Suspension
 Partial Suspension
 Cable Yarding Specified



UNIT DESCRIPTIONTIMBER SALE: FrostyUnit Number: 7ACRES 51VCU 524Compartment 138Stand 808DEVELOPMENT OF FINAL UNIT BOUNDARY

The unit was included in all action alternatives in the DEIS with the following acreages: alternative 2 (117 acres); 3 (51 acres); and 4 (51 acres). The difference in unit size among the alternatives was in consideration of the impact to the visual resource as seen from Frosty Bay and Seward Passage. An additional concern was to provide for a buffer strip along the Class II stream within the unit.

RESOURCE CONFLICTS AND MITIGATION

Visual

Conflict: Impact of cutting unit on view from Frosty Bay.

Mitigation: The unit in the preferred alternative will meet the visual quality objective. The backline of the unit will be designed to lessen visual impact.

Stream/Watershed

Conflict: Class III stream on eastern portion of unit should be given adequate protection.

Mitigation: A no-cut buffer will be established along slope break. Landings have been established on both sides of stream to facilitate yarding.

DESCRIPTION OF UNIT ATTRIBUTES/OBJECTIVES

Road Development:

0.4 Miles of Specified Road within unit.
0.0 Miles of spur road anticipated.
4 Landings (number)

Timber Attributes:

1,418 mbf Estimated volume within the unit
28 mbf Estimated volume per acre for entire unit
 Acres by Volume Class within the unit:
 6 Volume Class 0 (less than 8 mbf/acre)
 6 Volume Class 4 (8-20 mbf/acre)
 - Volume Class 5 (20-30 mbf/acre)
 39 Volume Class 6 (30-50 mbf/acre)
 - Volume Class 7 (50+ mbf/acre)

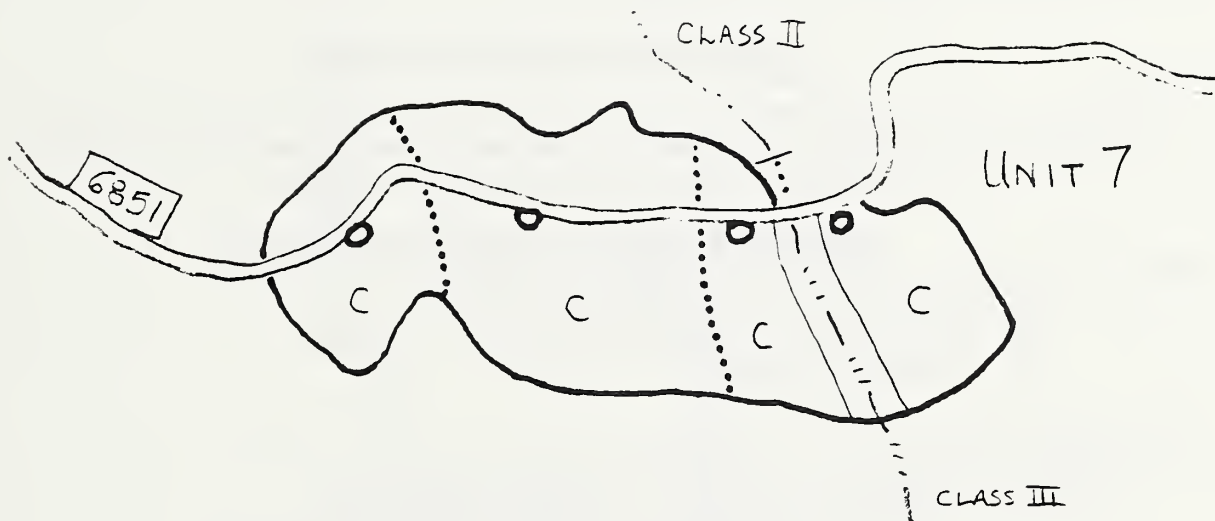
Stand Management Objectives: Even Age Rotation Period: 100 years

Regeneration Method: Natural Anticipated Treatments: Precommercial Thinning

Other Timber Considerations: None

PROPOSED ACTION OR DEVELOPMENT

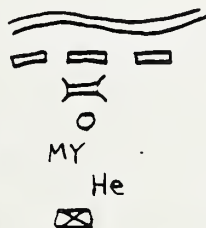
Stand will be highlead yarded and the one stream on the eastern portion of the unit will have an appropriate AHMU buffer established.



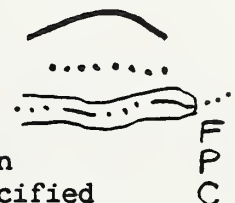
Approximate Drawing Scale: 1" = 660 feet (top of page is north)

Legend:

New Specified Road
 Temporary Road
 Temporary Bridges
 Landings
 Mobile Yarder Settings
 Helicopter Settings
 Helicopter Landing



Unit Boundary
 Setting Boundary
 Stream Buffer
 Full Suspension
 Partial Suspension
 Cable Yarding Specified



UNIT DESCRIPTIONTIMBER SALE: FrostyUnit Number: 8ACRES 32VCU 524Compartment 138Stand 807DEVELOPMENT OF FINAL UNIT BOUNDARY

The unit was included in all action alternatives in the DEIS with the following acreages: alternative 2 (73 acres); 3 (49 acres) and 4 (49 acres). The major difference in acreage among the alternatives was in consideration of the visual impact on Frosty Bay. Further field review resulted in changes from the DEIS. Part of the one setting previously dropped for visual reasons has been added. Spur access has been changed and unit size has been reduced by eliminating a low volume setting on the south end of the unit. By accessing the unit from the bottom and reconfiguring the unit, the spur road length has been reduced from 0.9 miles to 0.3 miles.

RESOURCE CONFLICTS AND MITIGATION

Visual

Conflict: The visual impact of this unit on boaters located in Frosty Bay.

Mitigation: Part of one setting on the north end of the unit was added. If full setting added, impact would be greater.

DESCRIPTION OF UNIT ATTRIBUTES/OBJECTIVES

Road Development: (Rounded to nearest 0.1 mile)

0.0 Miles of Specified Road within unit.

0.3 Miles of spur road anticipated.

4 Landings (number)

Timber Attributes:

1,074 mbf Estimated volume within entire unit

34 mbf Estimated Volume per acre for entire unit

Acres by Volume Class within the unit:

1 Volume Class 4 (8-20 mbf/acre)

- Volume Class 5 (20-30 mbf/acre)

31 Volume Class 6 (30-50 mbf/acre)

- Volume Class 7 (50+ mbf/acre)

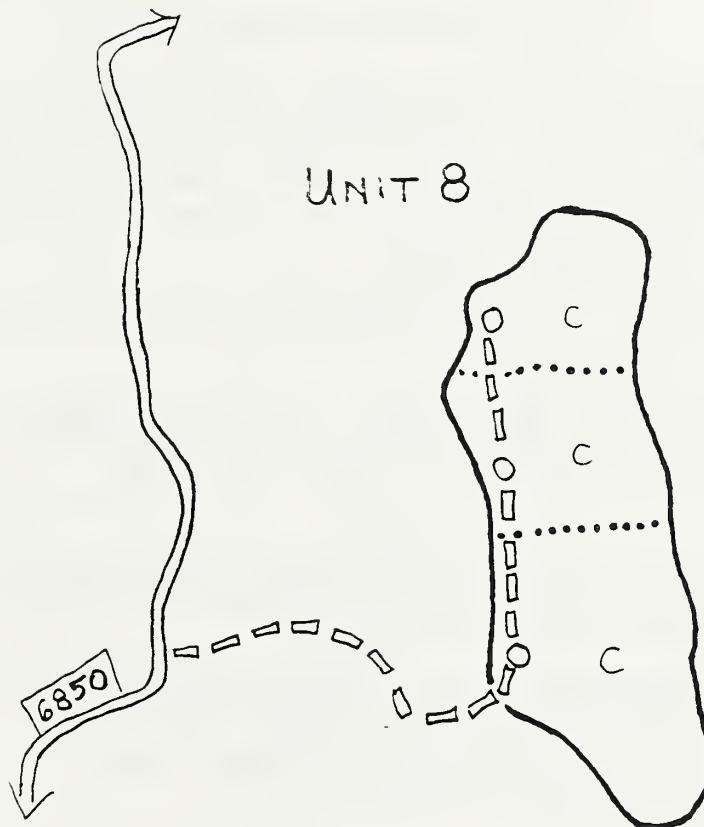
Stand Management Objectives: Even Age Rotation Period: 100 years

Regeneration Method: Natural Anticipated Treatments: Precommercial Thinning

Other Timber Considerations: None

PROPOSED ACTION OR DEVELOPMENT

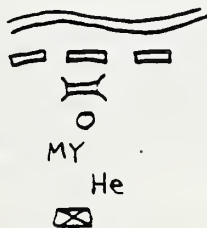
Stand will be highlead yarded and accessed from the 6850 by spur road along the toe of the slope. No further mitigation measures required.



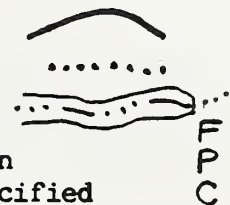
Approximate Drawing Scale: 1" = 660 feet (top of page is north)

Legend:

New Specified Road
 Temporary Road
 Temporary Bridges
 Landings
 Mobile Yarder Settings
 Helicopter Settings
 Helicopter Landing



Unit Boundary
 Setting Boundary
 Stream Buffer
 Full Suspension
 Partial Suspension
 Cable Yarding Specified



UNIT DESCRIPTIONTIMBER SALE: FrostyUnit Number: 9ACRES 76VCU 524Compartment 138Stand 805DEVELOPMENT OF FINAL UNIT BOUNDARY

The unit was included in all action alternatives in the DEIS with the following acreages: alternative 2 (88 acres); 3 (81 acres) and 4 (81 acres). In the FEIS, five more acres between the lakes and road have been eliminated from the unit.

RESOURCE CONFLICTS AND MITIGATIONWildlife

Conflict: Habitat values for goose around lakes is high.

Mitigation: Strip of timber between lakes and below road has been deleted from unit. Unit boundary between lakes will follow road clearing limits. There will be no falling of timber within the unit on the northern settings adjacent to lakes during the goose nesting period (4/1-6/15).

Conflict: Some deer values are present within this unit.

Mitigation: Deer values have been adequately protected within drainage.

Soils

Conflict: Soil hazard was rated high in resource inventories.

Mitigation: Hazard rating overstated. Field review determined that risk is not above average.

Stream/Watershed

Conflict: Proper protection is given to creeks within the unit.

Mitigation: No buffer required on creeks. Partial suspension will be specified on appropriate areas.

DESCRIPTION OF UNIT ATTRIBUTES/OBJECTIVES

Road Development: (Rounded to nearest 0.1 mile)

0.6 Miles of Specified Road within unit.

0.4 Miles of spur road anticipated.

5 Landings (number)

Timber Attributes:

1,445 mbf Estimated total volume within the entire unit

19 mbf Estimated Volume per acre for entire unit

Acres by Volume Class within the unit:

31 Volume Class 4 (8-20 mbf/acre)

45 Volume Class 5 (20-30 mbf/acre)

- Volume Class 6 (30-50 mbf/acre)

- Volume Class 7 (50+ mbf/acre)

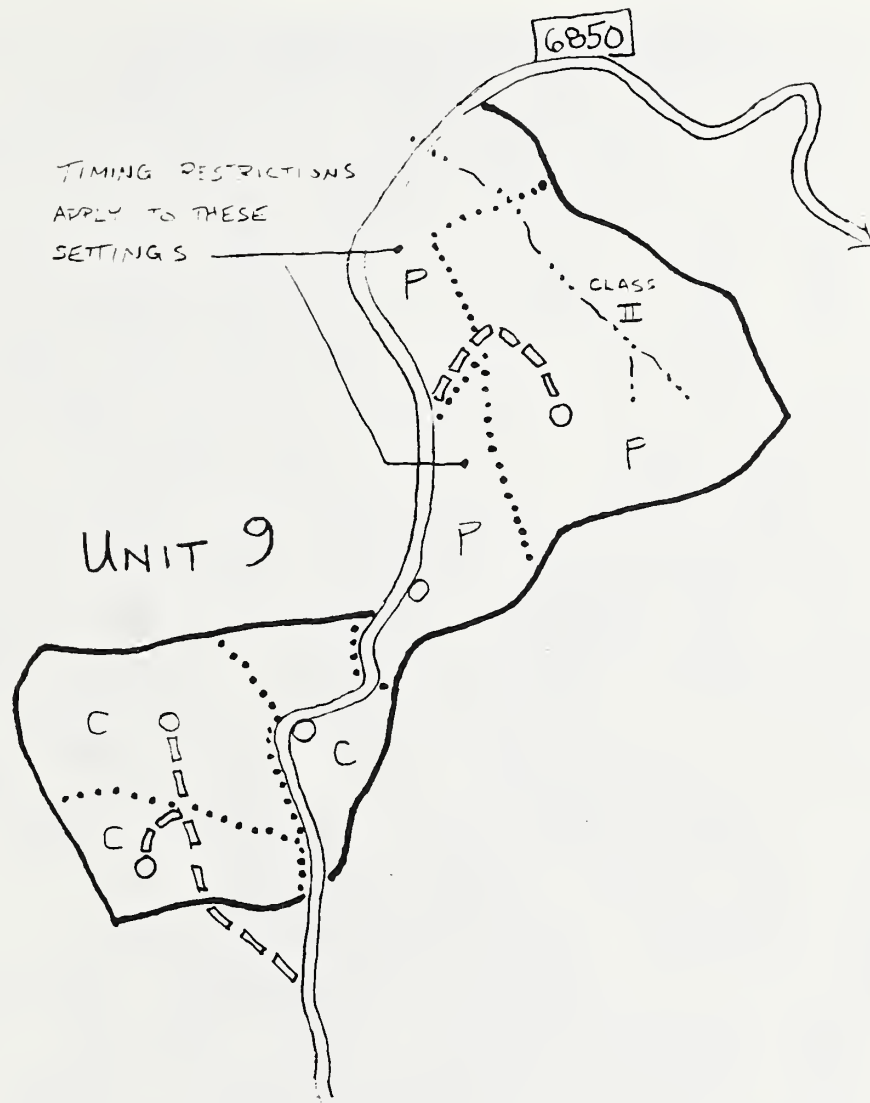
Stand Management Objectives: Even Age Rotation Period: 100 years

Regeneration Method: Natural Anticipated Treatments: Precommercial Thinning

Other Timber Considerations: None

PROPOSED ACTION OR DEVELOPMENT

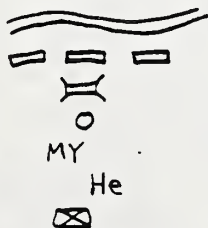
Stand will be highlead yarded and access from the 6850 will be by spur roads. The southeastern boundary will be approximately 200 feet from Frosty Creek and 100 feet from a tributary to that creek. No buffer strips are required within the unit.



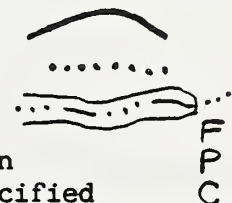
Approximate Drawing Scale: 1" = 660 feet (top of page is north)

Legend:

New Specified Road
 Temporary Road
 Temporary Bridges
 Landings
 Mobile Yarder Settings
 Helicopter Settings
 Helicopter Landing



Unit Boundary
 Setting Boundary
 Stream Buffer
 Full Suspension
 Partial Suspension
 Cable Yarding Specified









Units on Aerial Photograph

North is Toward Top of Page

Approximate Scale: 1 Inch = 1320 Feet

	Specified Road		Unit Boundary
	Stream Channels		Setting Boundary Within Unit



DEVELOPMENT OF FINAL UNIT BOUNDARY

The unit was included in two of the action alternatives in the DEIS with the following acreages: alternative 2 (83 acres); alternative 3 (75 acres). It was deleted from alternative 4. Some changes have been made to this unit since the DEIS. The main consideration has been the large 80' bridge needed to cross Frosty Creek. The options have been: 1) build temporary bridge with timber from sale area or from outside the sale area; 2) the Forest Service to purchase a portable bridge; or 3) cheaper methods of construction such as a ford or a bridge with center supports. If none of these proved feasible, then the unit would be appraised for helicopter logging. The portable bridge option was chosen. Buffer strips were determined to be needed for two streams within the unit. The spur road was relocated downhill to minimize soil disturbance. Large patch of blowdown occurred during winter of 89-90 within the unit and the Frosty Creek leave strip outside the unit.

RESOURCE CONFLICTS AND MITIGATION

Wildlife

Conflict: Need to protect geese during nesting season.

Mitigation: There will be no falling of timber during goose nesting period (4/1-6/15) in the floodplain area of unit.

Stream/Watershed

Conflict: Creeks within the unit and Frosty Creek should be given appropriate protection.

Mitigation: Leave strip established along Frosty Creek. Approximately 20% of this strip has already blowdown. Creeks within the unit will be given 50 foot transition buffers for windfirmness. On easternmost stream within the unit, an island, within the stream channel, will be given a no-cut buffer status.

Soils

Conflict: Some areas will need to have partial suspension specified.

Mitigation: Partial suspension specified on one setting. Spur road has been relocated in unit to decrease excavation and soil disturbance.

DESCRIPTION OF UNIT ATTRIBUTES/OBJECTIVES

Road Development: (Rounded to nearest 0.1 mile)

0.0 Miles of Specified Road within unit.

0.4 Miles of spur road anticipated.

5 Landings (number)

Timber Attributes:

1,165 mbf Estimated total volume within the unit

22 mbf Estimated volume per acre for entire unit

Acres by Volume Class within the unit:

- Volume Class 4 (8-20 mbf/acre)

52 Volume Class 5 (20-30 mbf/acre)

- Volume Class 6 (30-50 mbf/acre)

- Volume Class 7 (50+ mbf/acre)

Stand Management Objectives: Even Age Rotation Period: 100 years

Regeneration Method: Natural Anticipated Treatments: Precommercial Thinning

Other Timber Considerations: None

PROPOSED ACTION OR DEVELOPMENT

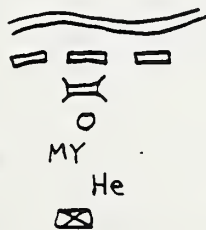
Stand will be planned for highlead yarding with specified road 54501 providing access. There will be a spur road off the end of the 54501 road into the unit. A temporary portable bridge on log sills will be installed across Frosty Creek. Two large culvert crossings will be required within the unit and the two creeks will require transition buffers of 50 feet and a small island on the lower reach of the easternmost creek will be given a "no-cut" status. Partial suspension will be required on the one setting on the eastern portion of the unit. Helicopter landing for Unit 22 is planned at the westernmost landing within this unit.



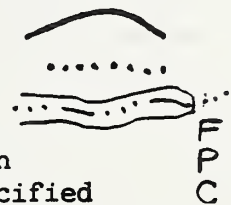
Approximate Drawing Scale: 1" = 660 feet (top of page is north)

Legend:

New Specified Road
 Temporary Road
 Temporary Bridges
 Landings
 Mobile Yarder Settings
 Helicopter Settings
 Helicopter Landing



Unit Boundary
 Setting Boundary
 Stream Buffer
 Full Suspension
 Partial Suspension
 Cable Yarding Specified



UNIT DESCRIPTION

TIMBER SALE: Frosty Unit Number: 10B

ACRES 56 VCU 524 Compartment 138 Stand 824

DEVELOPMENT OF FINAL UNIT BOUNDARY

The unit was included in all action alternatives in the DEIS with an acreage of 52 acres. Only a few minor adjustments have been made since the DEIS. The 6850 road provides the access to this unit.

RESOURCE CONFLICTS AND MITIGATION

Stream/Watershed

Conflict: Class III stream within the unit be given adequate protection.

Mitigation: Transition buffer of 50 foot plus a 50 foot no-cut buffer specified along stream below the road. Above the road, there will be a no-cut buffer established at the slope break.

Soils

Conflict: Some protection required in yarding.

Mitigation: Partial suspension specified on all settings above the road.

Wildlife

Conflict: Need to protect geese during the nesting season.

Mitigation: There will be no falling of timber in the northern most setting of unit or settings located below the specified road during the goose nesting period (4/1-6/15).

DESCRIPTION OF UNIT ATTRIBUTES/OBJECTIVES

Road Development: (Rounded to nearest 0.1 mile)

0.5 Miles of Specified Road within unit.

0.1 Miles of spur road anticipated.

5 Landings (number)

Timber Attributes:

1,238 mbf Estimated total volume within the unit

22 mbf Estimated Volume per acre for entire unit

Acres by Volume Class within the unit:

2 Volume Class 4 (8-20 mbf/acre)

54 Volume Class 5 (20-30 mbf/acre)

- Volume Class 6 (30-50 mbf/acre)

- Volume Class 7 (50+ mbf/acre)

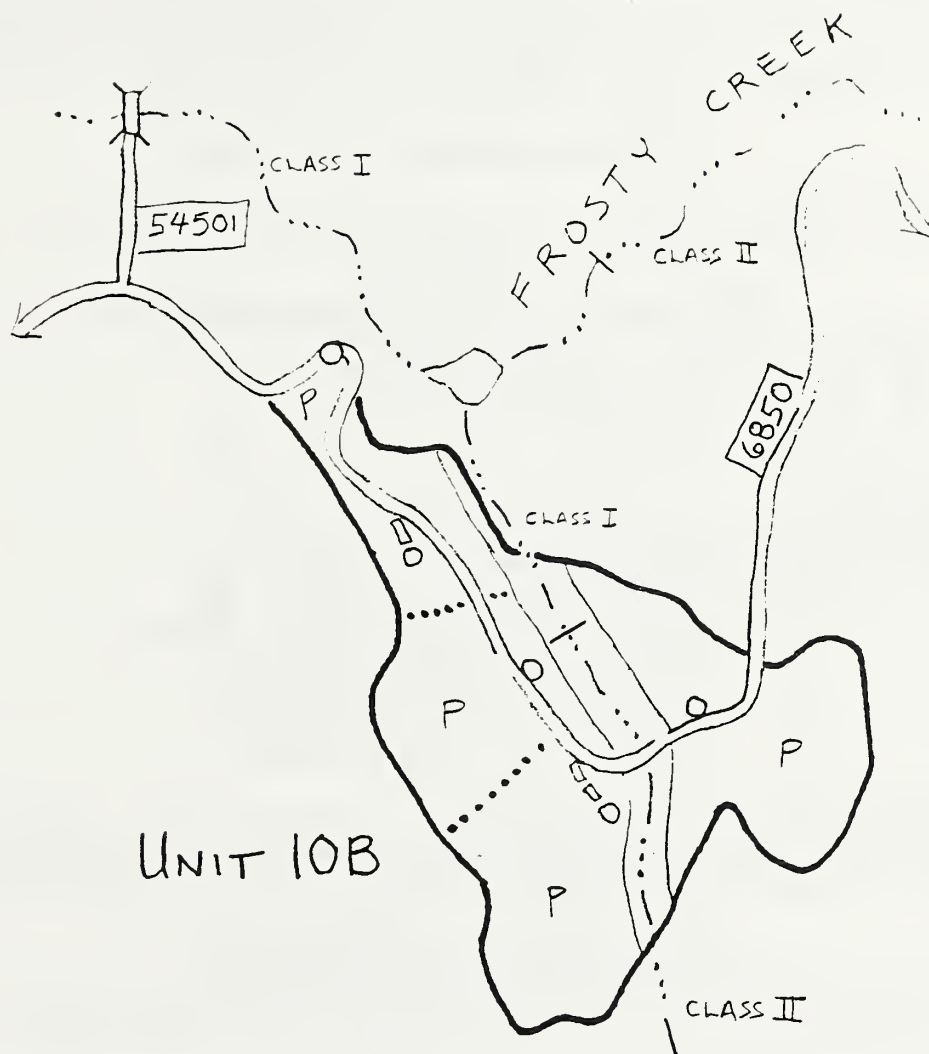
Stand Management Objectives: Even Age Rotation Period: 100 years

Regeneration Method: Natural Anticipated Treatments: Precommercial Thinning

Other Timber Considerations: None

PROPOSED ACTION OR DEVELOPMENT

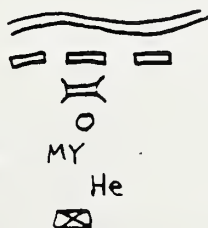
Stand will be planned for highlead yarding. All settings above the road will require partial suspension which can be achieved with high lead yarding with adequate tail holds. Only one short stub spur will be needed. A transition buffer of 50 feet in addition to a 50 foot no-cut buffer will be established on stream down the middle of the unit below the road. Above the road, a no-cut buffer will be established at the slope break..



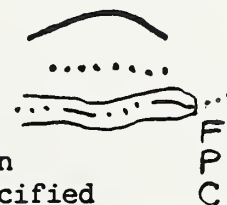
Approximate Drawing Scale: 1" = 660 feet (top of page is north)

Legend:

New Specified Road
 Temporary Road
 Temporary Bridges
 Landings
 Mobile Yarder Settings
 Helicopter Settings
 Helicopter Landing



Unit Boundary
 Setting Boundary
 Stream Buffer
 Full Suspension
 Partial Suspension
 Cable Yarding Specified



UNIT DESCRIPTION

TIMBER SALE: Frosty Unit Number: 11

ACRES 33 VCU 524 Compartment 138 Stand 823

DEVELOPMENT OF FINAL UNIT BOUNDARY

The unit was included in all action alternatives in the DEIS with 13 acres for each alternative. Resource concerns are associated with the soil. Field review conducted this spring (1990) determined that a spur road from the 6851 road was feasible and that this would not only make additional volume available, but would also make uphill yarding possible on most of the unit.

RESOURCE CONFLICTS AND MITIGATION

Soils:

Conflict: Adequate protection is given to soil resource.

Mitigation: Uphill yarding will reduce the impact on the soil resource.

DESCRIPTION OF UNIT ATTRIBUTES/OBJECTIVES

Road Development: (Rounded to nearest 0.1 mile)

0.0 Miles of Specified Road within unit.

0.4 Miles of spur road anticipated.

3 Landings (number)

Timber Attributes:

694 mbf Estimated volume within the entire unit

21 mbf Estimated volume per acre for entire unit

Acres by Volume Class within the unit:

2 Volume Class 0 (less than 8 mbf/acre)

- Volume Class 4 (8-20 mbf/acre)

31 Volume Class 5 (20-30 mbf/acre)

- Volume Class 6 (30-50 mbf/acre)

- Volume Class 7 (50+ mbf/acre)

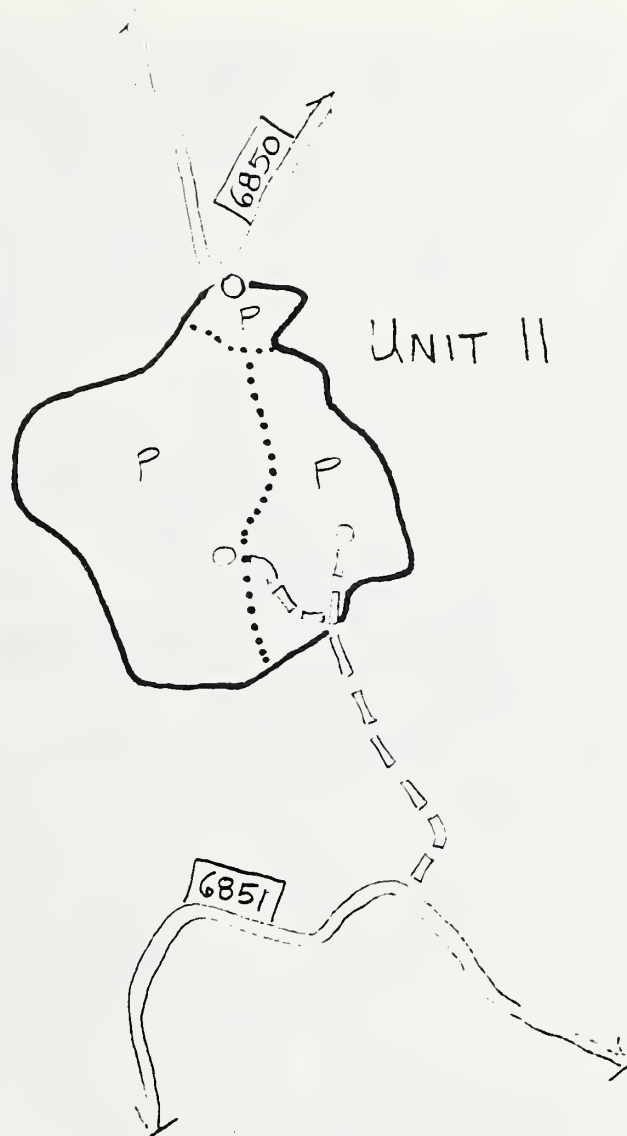
Stand Management Objectives: Even Age Rotation Period: 100 years

Regeneration Method: Natural Anticipated Treatments: Precommercial Thinning

Other Timber Considerations: None

PROPOSED ACTION OR DEVELOPMENT

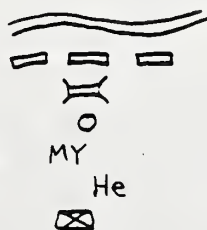
Stand will be planned for highlead yarding. Spur road will be built from 6851 road to access most of unit. One small setting will be along 6850 road. No buffer strips required.



Approximate Drawing Scale: 1" = 660 feet (top of page is north)

Legend:

New Specified Road
 Temporary Road
 Temporary Bridges
 Landings
 Mobile Yarder Settings
 Helicopter Settings
 Helicopter Landing



Unit Boundary
 Setting Boundary
 Stream Buffer
 Full Suspension
 Partial Suspension
 Cable Yarding Specified









Units on Aerial Photograph

North is Toward Top of Page

Approximate Scale: 1 Inch = 1320 Feet

	Specified Road		Unit Boundary
	Stream Channels		Setting Boundary Within Unit



UNIT DESCRIPTION

TIMBER SALE: Frosty Unit Number: 12B

ACRES 50 VCU 524 Compartment 138 Stand 821 & 822

DEVELOPMENT OF FINAL UNIT BOUNDARY

This is what remains of a unit which extended across Frosty Creek in the original Cleveland Timber Sale. In the DEIS alternatives, this unit had the following size: alternative 2 (112 acres); 3 (60 acres); 4 (60 acres). Because the unit in alternative 2 was adjacent to helicopter unit B and unit 13A these units totaled 230 acres. For protection of the stream in this unit, a leave strip was put down the center of the unit, and it is now subdivided into two parts, but the unit 12B designation for both portions was retained for clarity (there will be two stand designations for silvicultural purposes). Both portions of the unit now totals only 50 acres.

RESOURCE CONFLICTS AND MITIGATION

Stream/Watershed

Conflict: Class II stream flows through the middle of this unit.

Mitigation: A leave strip was established and the unit is now subdivided into two units. The eastern portion of the unit above the road will have a 25 foot no-cut buffer established next to creek.

Soils

Conflict: Soil resource is given adequate protection.

Mitigation: Partial suspension specified on two settings within the unit.

Wildlife

Conflict: Need to protect geese during nesting season.

Mitigation: There will be no falling of timber below the specified road during the goose nesting period (4/1-6/15).

DESCRIPTION OF UNIT ATTRIBUTES/OBJECTIVES

Road Development: (Rounded to nearest 0.1 mile)

0.4 Miles of Specified Road within unit.

0.6 Miles of spur road anticipated.

5 Landings (number)

Timber Attributes:

1,020 mbf Estimated total volume within the unit

20 mbf Estimated Volume per acre for entire unit

Acres by Volume Class within the unit:

12 Volume Class 4 (8-20 mbf/acre)

38 Volume Class 5 (20-30 mbf/acre)

- Volume Class 6 (30-50 mbf/acre)

- Volume Class 7 (50+ mbf/acre)

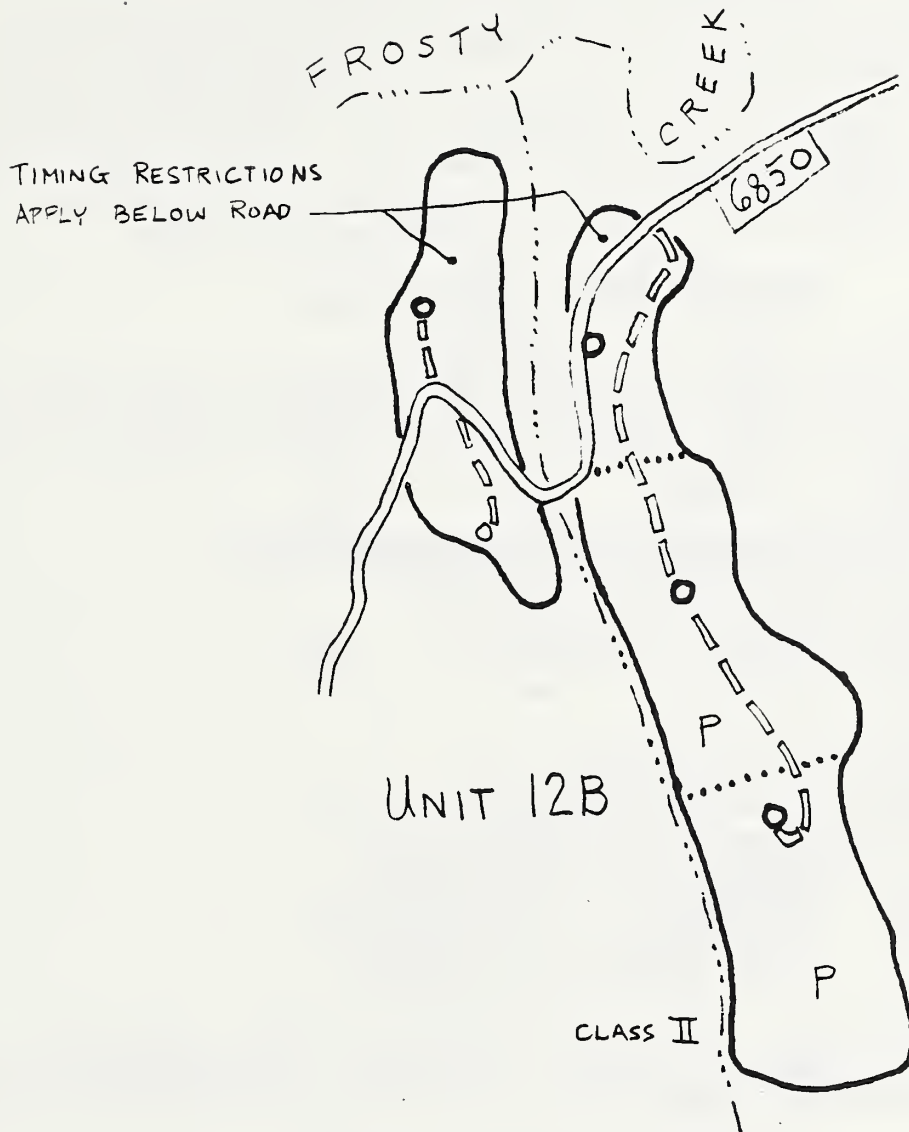
Stand Management Objectives: Even Age Rotation Period: 100 years

Regeneration Method: Natural Anticipated Treatments: Precommercial Thinning

Other Timber Considerations: None

PROPOSED ACTION OR DEVELOPMENT

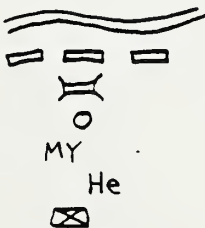
Unit will be planned for highlead yarding. Two settings will require partial suspension which can be achieved with high lead yarding with adequate tail holds. Three separate spurs will be required to access landings from the 6850 road. Trees can be harvested to bank break on portion of unit on east side of creek above the road.



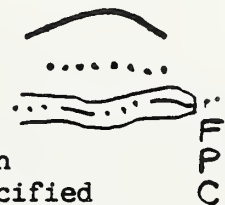
Approximate Drawing Scale: 1" = 660 feet (top of page is north)

Legend:

New Specified Road
 Temporary Road
 Temporary Bridges
 Landings
 Mobile Yarder Settings
 Helicopter Settings
 Helicopter Landing



Unit Boundary
 Setting Boundary
 Stream Buffer
 Full Suspension
 Partial Suspension
 Cable Yarding Specified



UNIT DESCRIPTIONTIMBER SALE: FrostyUnit Number: 13AACRES 38VCU 524Compartment 138Stand 827DEVELOPMENT OF FINAL UNIT BOUNDARY

In all three action alternatives the acreage for this unit was 41 acres. In alternative 2 of the DEIS, this unit was adjacent to the proposed helicopter unit B which was located adjacent to unit 12. With the three units (12, B, and 13A) the size was 230 acres. In alternatives 3 and 4 of the DEIS, a combination of helicopter unit B and this unit equaled 118 acres. The helicopter unit has been dropped from consideration and thus the oversized unit situation has been resolved. Unit 13A has remained basically the same between the preferred alternative in the DEIS and the preferred alternative in the FEIS.

RESOURCE CONFLICTS AND MITIGATIONStream/Watershed

Conflict: A Class III stream passes through this unit.

Mitigation: A 50 foot transition buffer will be specified along this stream, and where the stream "flattens" out near the middle of the unit, the buffer will change to a 25 foot no-cut and 25 foot transition buffer.

DESCRIPTION OF UNIT ATTRIBUTES/OBJECTIVES

Road Development: (Rounded to nearest 0.1 mile)

0.0 Miles of Specified Road within unit.0.6 Miles of spur road anticipated.4 Landings (number)Timber Attributes:851 mbf Estimated volume within the unit22 mbf Estimated volume per acre for entire unit

Acres by Volume Class within the unit:

- Volume Class 4 (8-20 mbf/acre)38 Volume Class 5 (20-30 mbf/acre)- Volume Class 6 (30-50 mbf/acre)- Volume Class 7 (50+ mbf/acre)Stand Management Objectives: Even Age Rotation Period: 100 yearsRegeneration Method: Natural Anticipated Treatments: Precommercial ThinningOther Timber Considerations: NonePROPOSED ACTION OR DEVELOPMENT

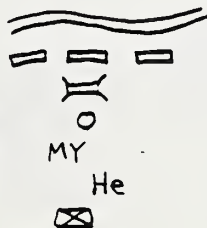
Unit will be planned for highlead yarding with access off the 6850 road provided by a spur. Two small bridges will be required, one within the unit and the other across the upper reaches of Frosty Creek. A transition buffer of 50 feet is specified along the one stream within the unit and where the stream flattens out near the center of the unit it changes to a 25 foot no-cut and 25 foot transition buffer.



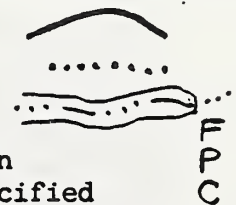
Approximate Drawing Scale: 1" = 660 feet (top of page is north)

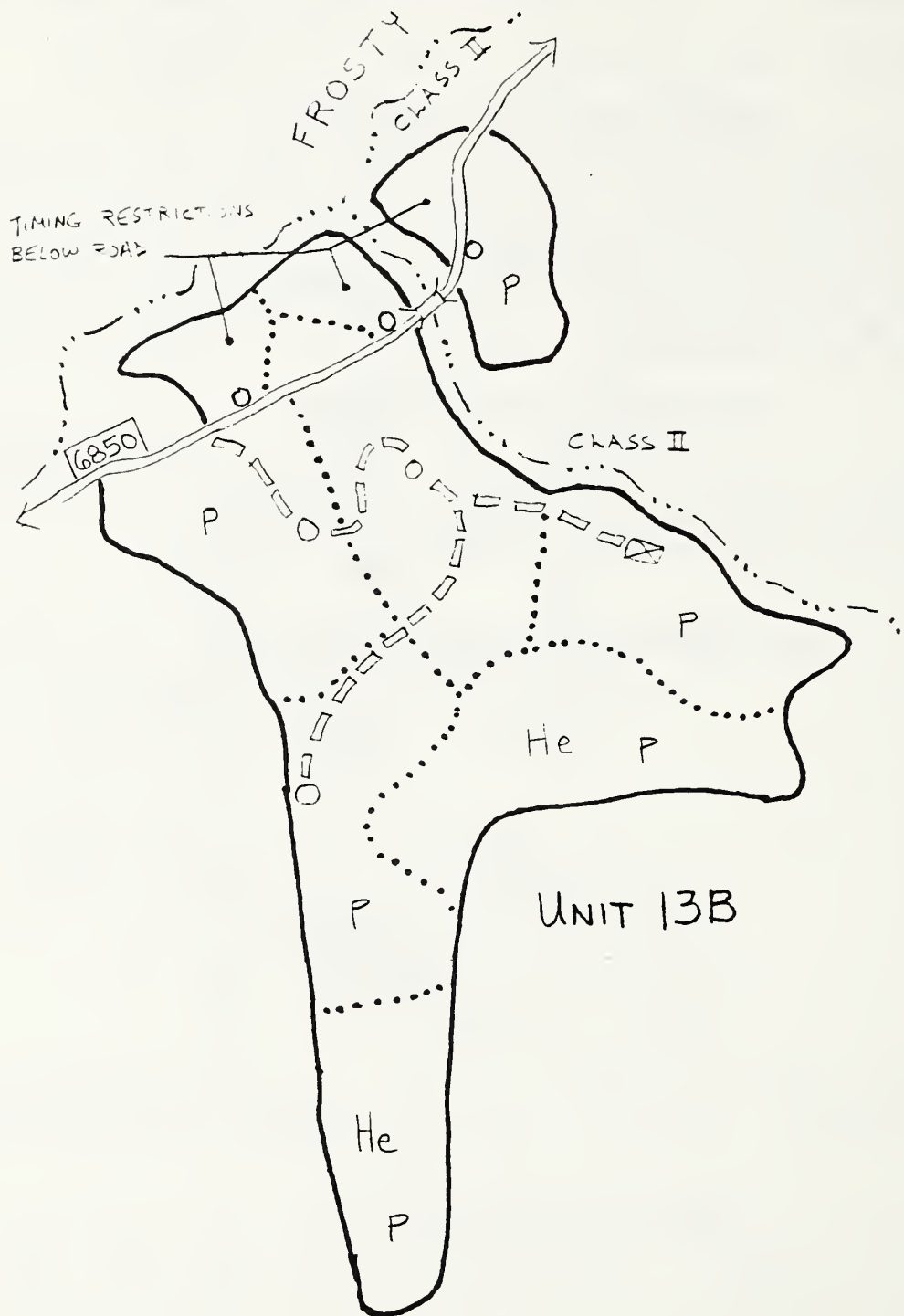
Legend:

New Specified Road
 Temporary Road
 Temporary Bridges
 Landings
 Mobile Yarder Settings
 Helicopter Settings
 Helicopter Landing



Unit Boundary
 Setting Boundary
 Stream Buffer
 Full Suspension
 Partial Suspension
 Cable Yarding Specified

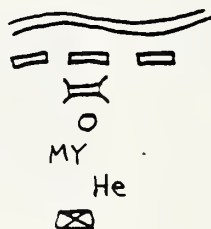




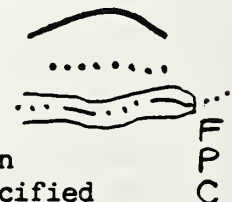
Approximate Drawing Scale: 1" = 660 feet (top of page is north)

Legend:

New Specified Road
 Temporary Road
 Temporary Bridges
 Landings
 Mobile Yarder Settings
 Helicopter Settings
 Helicopter Landing



Unit Boundary
 Setting Boundary
 Stream Buffer
 Full Suspension
 Partial Suspension
 Cable Yarding Specified



UNIT DESCRIPTIONTIMBER SALE: FrostyUnit Number: 13BACRES 111VCU 524Compartment 138Stand 817,818
819,820DEVELOPMENT OF FINAL UNIT BOUNDARY

The acreage of the highlead unit was 61 acres in every alternative in the DEIS. The adjacent helicopter units were shown as 85 acres and the total unit acreage was then 146 acres in the DEIS. Both the helicopter and high lead acreage have been reduced to 28 and 83 acres respectively. Changes were made to allow for a leave strip along Frosty Creek and a large tributary flowing through the unit. Some of the poorer timber in the helicopter areas was also deleted. Multiple stand numbers are shown for the unit to differentiate the helicopter from the cable yarding settings.

RESOURCE CONFLICTS AND MITIGATION

Stream/Watershed

Conflict: Adequate protection be given to Class II streams adjacent to unit.

Mitigation: No-cut buffer strips have been established along Frosty Creek and on the lower reaches of a major tributary on the eastern portion of the unit. A no-cut buffer will also be established on the slope break on the upper reaches of the major tributary.

Soils

Conflict: Appropriate protection is given to the soil resource.

Mitigation: Partial suspension specified on most of unit.

Wildlife

Conflict: Need to protect geese during nesting season.

Mitigation: There will be no falling of timber within the unit below the specified road during the goose nesting period (4/1-6/15).

DESCRIPTION OF UNIT ATTRIBUTES/OBJECTIVES

Road Development: (Rounded to nearest 0.1 mile)

0.4 Miles of Specified Road within unit.

0.7 Miles of spur road anticipated.

7 Landings (number)

Timber Attributes:

2,400 mbf Estimated total volume within the unit

22 mbf Estimated volume per acre for entire unit

Acres by Volume Class within the unit:

<u>1</u>	Volume Class 0 (less than 8 mbf/acre)
<u>12</u>	Volume Class 4 (8-20 mbf/acre)
<u>95</u>	Volume Class 5 (20-30 mbf/acre)
<u>3</u>	Volume Class 6 (30-50 mbf/acre)
<u>-</u>	Volume Class 7 (50+ mbf/acre)

Stand Management Objectives: Even Age Rotation Period: 100 years

Regeneration Method: Natural Anticipated Treatments: Precommercial Thinning

Other Timber Considerations: None

PROPOSED ACTION OR DEVELOPMENT

Unit will be planned for both helicopter and highlead yarding. Four highlead settings will require partial suspension. Two separate spurs will be required to access landings from the 6850 road and three landings will be along the road. There are two helicopter portions of this unit, and the average yarding distance will be 0.3 miles. Adequate buffers have been provided for as discussed above.

UNIT DESCRIPTIONTIMBER SALE: FrostyUnit Number: 14AACRES 46VCU 524Compartment 138Stand 828DEVELOPMENT OF FINAL UNIT BOUNDARY

The unit is located beyond the end of specified road 6850. Access will be provided by spur roads. Two small bridges will be required to cross the upper reaches of Frosty Creek which at these locations is narrow and slow moving. This unit had 50 acres shown in both Alternative 2 and 3 and was not included in alternative 4. It also showed a helicopter setting of 13 acres for a total acreage of 63 acres. Subsequent analysis has shown that this helicopter setting can be accessed by road. The spur roads may in subsequent years be used for the trail head for a trail system into the lakes on the upper ridges and toward the Anan drainage. Wildlife considerations in this unit were for deer and goose values.

RESOURCE CONFLICTS AND MITIGATIONWildlife

Conflict: Unit does have some deer range within it.

Mitigation: Adequate deer range protected within drainage to allow for harvest within this unit.

Conflict: Need to protect geese during nesting season.

Mitigation: There will be no falling of timber or spur road construction within the lower portions of the unit below the slope break during the goose nesting season (4/1-6/15).

Stream/Watershed

Conflict: Adequate protection given to the upper reaches of Class II stream.

Mitigation: A 50 foot no-cut buffer will be established along Frosty Creek.

DESCRIPTION OF UNIT ATTRIBUTES/OBJECTIVES

Road Development: (Rounded to nearest 0.1 mile)

0.0 Miles of Specified Road within unit.

0.6 Miles of spur road anticipated.

4 Landings (number)

Timber Attributes:

926 mbf Estimated total volume within the unit

20 mbf Estimated volume per acre for entire unit

Acres by Volume Class within the unit:

2 Volume Class 0 (less than 8 mbf/acre)

10 Volume Class 4 (8-20 mbf/acre)

32 Volume Class 5 (20-30 mbf/acre)

2 Volume Class 6 (30-50 mbf/acre)

- Volume Class 7 (50+ mbf/acre)

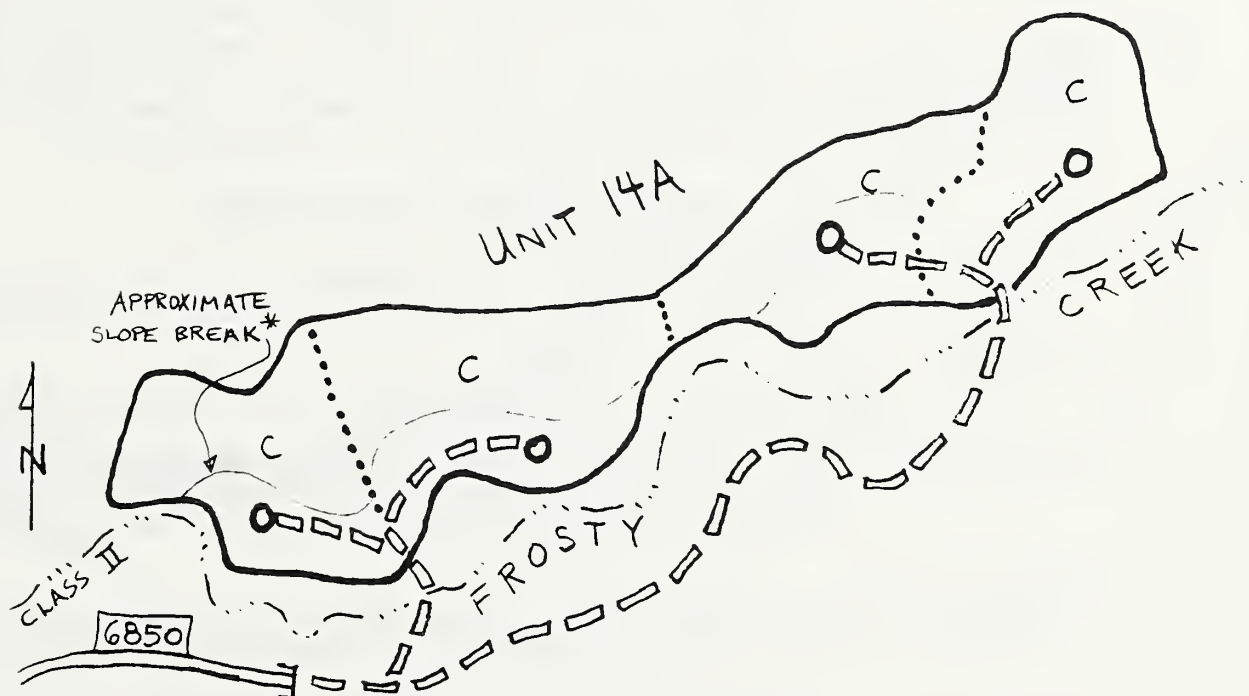
Stand Management Objectives: Even Age Rotation Period: 100 years

Regeneration Method: Natural Anticipated Treatments: Precommercial Thinning

Other Timber Considerations: None

PROPOSED ACTION OR DEVELOPMENT

Unit will be planned for highlead yarding. During the location of spur roads, starting point for trail to upper elevations should be explored.

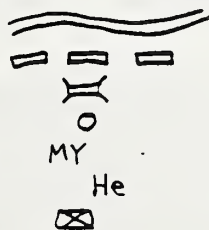


* TIMING RESTRICTIONS APPLY
BELOW SLOPE BREAK

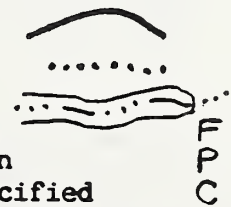
Approximate Drawing Scale: 1" = 660 feet (top of page is north)

Legend:

New Specified Road
Temporary Road
Temporary Bridges
Landings
Mobile Yarder Settings
Helicopter Settings
Helicopter Landing



Unit Boundary
Setting Boundary
Stream Buffer
Full Suspension
Partial Suspension
Cable Yarding Specified



UNIT DESCRIPTIONTIMBER SALE: FrostyUnit Number: 14BACRES 102VCU 524Compartment 138Stand 829 & 830DEVELOPMENT OF FINAL UNIT BOUNDARY

The end of the 6850 road is within the western edge of the unit. Access is then provided by a spur road which runs along the base of the slope along the northern edge of the unit with settings located along this spur. In the DEIS this unit had 65 acres in each alternative, and the helicopter settings above the backline totaled 53 acres. Total unit acreage in the DEIS was then 118 acres. Adjustments have been required with this unit and current acreage is now 102 acres (62 acres cable and 40 acres helicopter). Resource concerns have been largely limited to soils and deer values. The spur road in this unit may serve as a terminus for a trailhead for future recreational opportunities into the upland areas and toward Anan. The helicopter portion of the unit has a stand number of 830 while the highlead portion has been designated 829.

RESOURCE CONFLICTS AND MITIGATIONSoils

Conflict: Adequate protection be given to soil resource.

Mitigation: Partial suspension is specified on westernmost setting.

Wildlife

Conflict: Deer and goose values are present on the lower portions of this unit.

Mitigation: Adequate protection has been given to deer values within the area. Lower unit boundary placed along road to prevent harvest of goose nesting habitat between the road and creek.

Stream/Watershed

Conflict: Adequate protection is given to Class II stream adjacent to unit.

Mitigation: A 50 foot no-cut buffer established along Frosty Creek.

DESCRIPTION OF UNIT ATTRIBUTES/OBJECTIVES

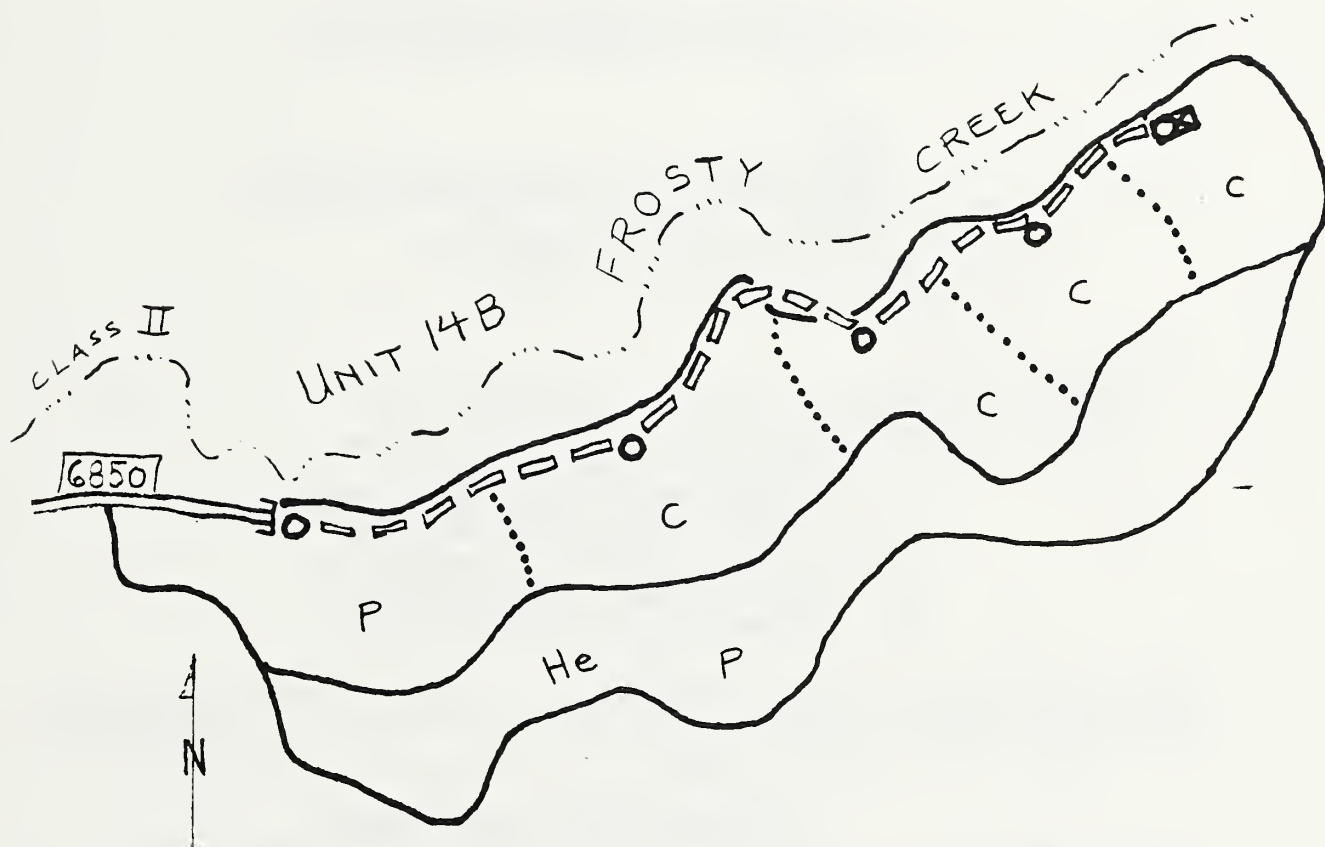
Road Development: (Rounded to nearest 0.1 mile)

0.1 Miles of Specified Road within unit.0.7 Miles of spur road anticipated.5 Landings (number)Timber Attributes:3,316 mbf Estimated total volume within the unit32 mbf Estimated volume per acre for entire unit

Acres by volume Class within the unit:

2 Volume Class 0 (less than 8 mbf/acre)4 Volume Class 4 (8-20 mbf/acre)2 Volume Class 5 (20-30 mbf/acre)94 Volume Class 6 (30-50 mbf/acre)- Volume Class 7 (50+ mbf/acre)Stand Management Objectives: Even Age Rotation Period: 100 yearsRegeneration Method: Natural Anticipated Treatments: Precommercial ThinningOther Timber Considerations: NonePROPOSED ACTION OR DEVELOPMENT

Unit will be planned for highlead yarding and helicopter logging along the upper portion of the unit. Partial suspension will be required on the setting near the end of the specified road. Helicopter landing for this unit and units 23 and 24 located on the second to the last setting of unit. Average yarding distance for helicopter yarding within this unit is 0.4 miles.



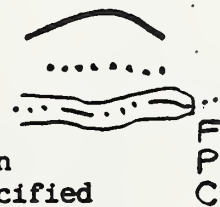
Approximate Drawing Scale: 1" = 660 feet (top of page is north)

Legend:

New Specified Road
 Temporary Road
 Temporary Bridges
 Landings
 Mobile Yarder Settings
 Helicopter Settings
 Helicopter Landing



Unit Boundary
 Setting Boundary
 Stream Buffer
 Full Suspension
 Partial Suspension
 Cable Yarding Specified



UNIT DESCRIPTIONTIMBER SALE: FrostyUnit Number: 15ACRES 20VCU 524Compartment 138Stand 809DEVELOPMENT OF FINAL UNIT BOUNDARY

This unit lies along the 6851 road. In the DEIS, all three action alternatives displayed this with 18 acres. There have been no substantive changes in this unit. There are few resource concerns within the unit.

RESOURCE CONFLICTS AND MITIGATION

There are no significant conflicts within the unit.

DESCRIPTION OF UNIT ATTRIBUTES/OBJECTIVES

Road Development: (Rounded to nearest 0.1 mile)

0.3 Miles of Specified Road within unit.

0.0 Miles of spur road anticipated.

2 Landings (number)

Timber Attributes:

561 mbf Estimated total volume within the unit

28 mbf Estimated volume per acre for entire unit

Acres by Volume Class within the unit:

3 Volume Class 0 (less than 8 mbf/acre)

1 Volume Class 4 (8-20 mbf/acre)

- Volume Class 5 (20-30 mbf/acre)

16 Volume Class 6 (30-50 mbf/acre)

- Volume Class 7 (50+ mbf/acre)

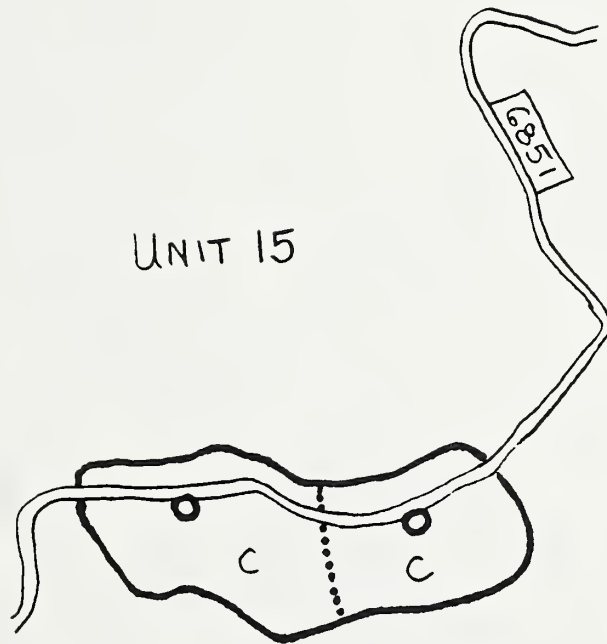
Stand Management Objectives: Even Age Rotation Period: 100 years

Regeneration Method: Natural Anticipated Treatments: Precommercial Thinning

Other Timber Considerations: None

PROPOSED ACTION OR DEVELOPMENT

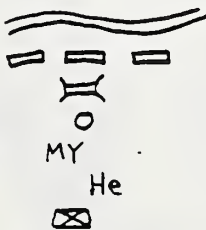
Unit will be planned for highlead yarding. Spur roads will not be required since the settings are along the 6851 road system.



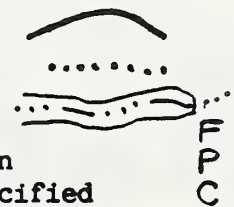
Approximate Drawing Scale: 1" = 660 feet (top of page is north)

Legend:

New Specified Road
 Temporary Road
 Temporary Bridges
 Landings
 Mobile Yarder Settings
 Helicopter Settings
 Helicopter Landing







Unit Boundary
 Setting Boundary
 Stream Buffer
 Full Suspension
 Partial Suspension
 Cable Yarding Specified



Units on Aerial Photograph

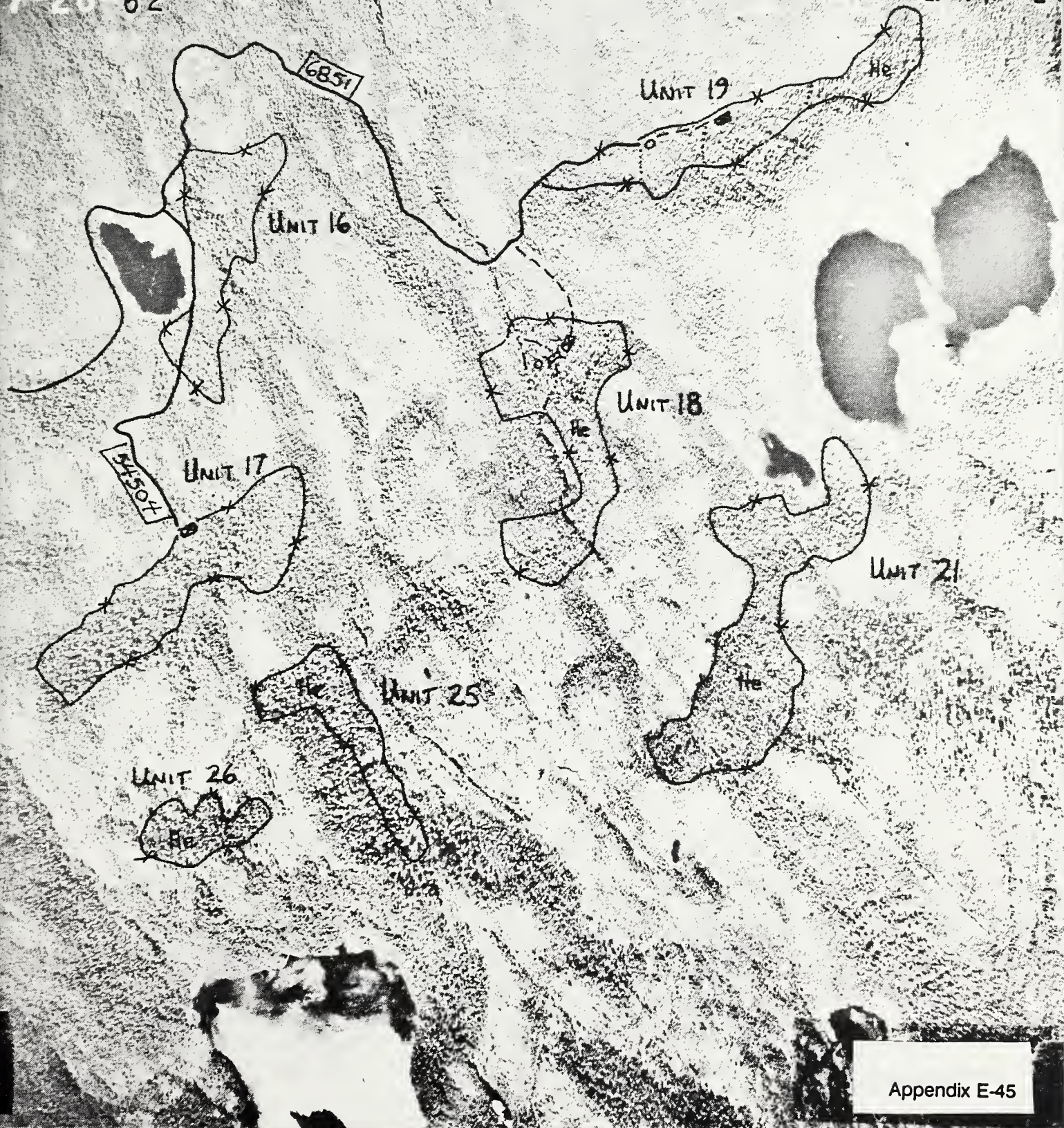
North is Toward Top of Page

Approximate Scale: 1 Inch = 1320 Feet

	Specified Road		Unit Boundary
	Stream Channels		Setting Boundary Within Unit

7-26-62

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UNIT DESCRIPTIONTIMBER SALE: FrostyUnit Number: 16ACRES 40VCU 524Compartment 138Stand 810DEVELOPMENT OF FINAL UNIT BOUNDARY

This unit lies along the 6851 road near a small lake. This was included in all action alternatives in the DEIS and shown with 50 acres. There have been no substantial adjustments except for the establishment of a 50 foot transition buffer strip along a secondary stream near the northern portion of the unit. The junction of the 6851 and 54504 roads will be located just outside of the unit and both roads will provide access to the unit. Two short spurs will also be required.

RESOURCE CONFLICTS AND MITIGATION

Watershed

Conflict: Adequate protection be given to Class II stream within the unit.

Mitigation: A 50 foot transition buffer will be established along this stream. Landings have been located to yard away from stream.

DESCRIPTION OF UNIT ATTRIBUTES/OBJECTIVES

Road Development: (Rounded to nearest 0.1 mile)

0.4 Miles of Specified Road within unit.0.3 Miles of spur road anticipated.6 Landings (number)

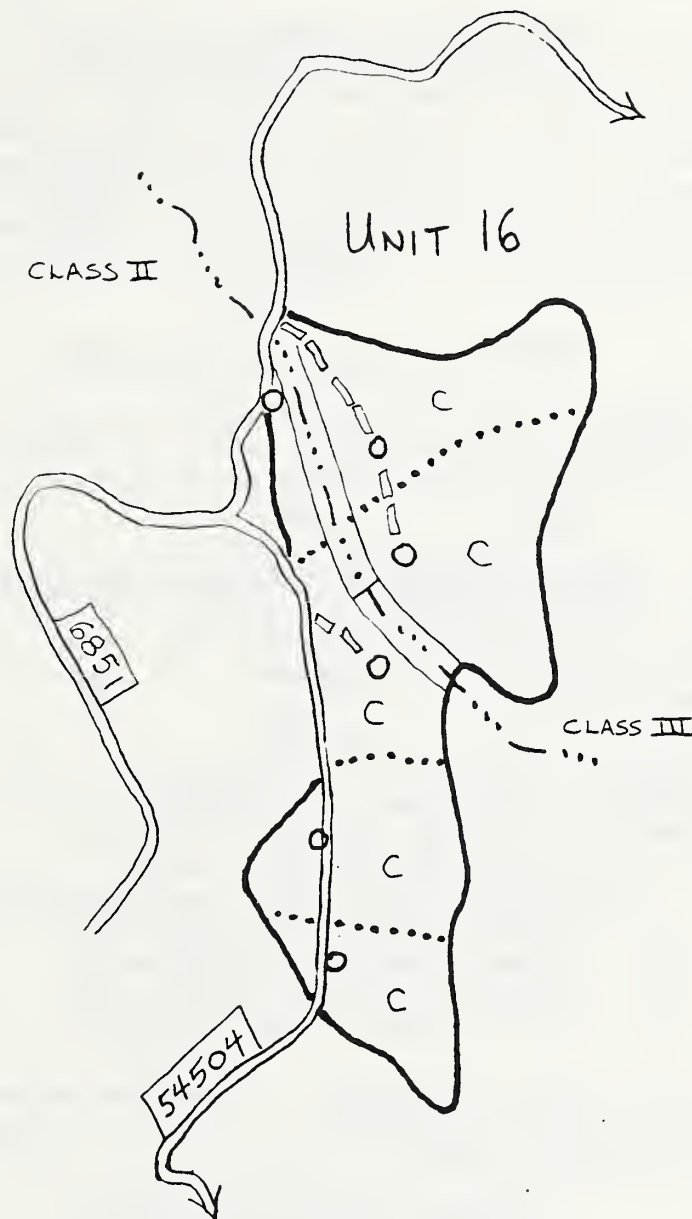
Timber Attributes:

536 mbf Estimated volume within the entire unit13 mbf Estimated volume per acre for entire unit

Acres by Volume Class within the unit:

2 Volume Class 0 (less than 8 mbf/acre)38 Volume Class 4 (8-20 mbf/acre)- Volume Class 5 (20-30 mbf/acre)- Volume Class 6 (30-50 mbf/acre)- Volume Class 7 (50+ mbf/acre)Stand Management Objectives: Even Age Rotation Period: 100 yearsRegeneration Method: Natural Anticipated Treatments: Precommercial ThinningOther Timber Considerations: NonePROPOSED ACTION OR DEVELOPMENT

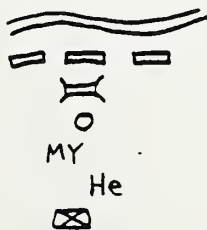
Unit will be planned for highlead yarding. Settings on both sides of the transition buffer will give added protection to stream.



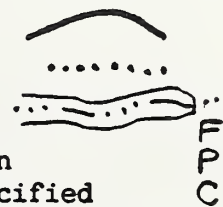
Approximate Drawing Scale: 1" = 660 feet (top of page is north)

Legend:

New Specified Road
 Temporary Road
 Temporary Bridges
 Landings
 Mobile Yarder Settings
 Helicopter Settings
 Helicopter Landing



Unit Boundary
 Setting Boundary
 Stream Buffer
 Full Suspension
 Partial Suspension
 Cable Yarding Specified



UNIT DESCRIPTIONTIMBER SALE: FrostyUnit Number: 17ACRES 46VCU 524Compartment 138Stand 811DEVELOPMENT OF FINAL UNIT BOUNDARY

This unit lies at the end of the 54504 south of unit 16. It was shown as 57 acres in all three actions alternatives in the DEIS. There have been no substantive changes in this unit but the acreage has decreased. The main concern with this unit is the inventoried hazardous soils on the southwestern portion of the unit. Field verification showed that soil hazard was not as extensive as was mapped in GIS. Unit can be cable logged as long as partial suspension is achieved. Terminus of road could be trailhead for recreation opportunities to the south.

RESOURCE CONFLICTS AND MITIGATIONSoils

Conflict: Adequate protection be given to soil resource within unit.

Mitigation: Field analysis determined that partial suspension for cable systems will give adequate protection to soil resource.

DESCRIPTION OF UNIT ATTRIBUTES/OBJECTIVES

Road Development: (Rounded to nearest 0.1 mile)

0.0 Miles of Specified Road within unit.0.4 Miles of spur road anticipated.4 Landings (number)Timber Attributes:1,008 mbf Estimated total volume within the entire unit22 mbf Estimated volume per acre for entire unit

Acres by Volume Class within the unit:

1 Volume Class 0 (less than 8 mbf/acre)- Volume Class 4 (8-20 mbf/acre)45 Volume Class 5 (20-30 mbf/acre)- Volume Class 6 (30-50 mbf/acre)- Volume Class 7 (50+ mbf/acre)Stand Management Objectives: Even Age Rotation Period: 100 yearsRegeneration Method: Natural Anticipated Treatments: Precommercial ThinningOther Timber Considerations: NonePROPOSED ACTION OR DEVELOPMENT

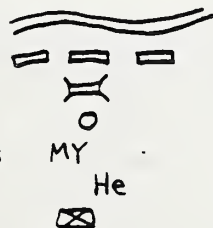
Unit will be high lead yarded with partial suspension specified. Helicopter landing for units 25 and 26 will be near middle of unit at junction of spur and specified road.



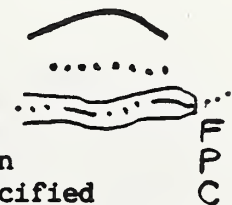
Approximate Drawing Scale: 1" = 660 feet (top of page is north)

Legend:

New Specified Road
 Temporary Road
 Temporary Bridges
 Landings
 Mobile Yarder Settings
 Helicopter Settings
 Helicopter Landing



Unit Boundary
 Setting Boundary
 Stream Buffer
 Full Suspension
 Partial Suspension
 Cable Yarding Specified



UNIT DESCRIPTIONTIMBER SALE: FrostyUnit Number: 18ACRES 45VCU 524Compartment 138Stand 812DEVELOPMENT OF FINAL UNIT BOUNDARY

This unit is accessed by a spur road from the 6851 road. In the DEIS the area was shown to have 78 acres harvested by cable systems in all three action alternatives. Unit J, a helicopter unit adjacent to this unit had 45 acres so the proposed unit would total 123 acres. Subsequent modifications have been made to reduce impacts for soil and secondary stream protection by eliminating areas and changing spur road access. The northern most helicopter setting was dropped because of low value timber. The current acreage is for 25 acres of cable yarding and 20 acres of helicopter logging.

RESOURCE CONFLICTS AND MITIGATIONStream/Watershed

Conflict: Adequate protection is given to Class III streams within the unit.

Mitigation: Landings have been established to facilitate protection of streams. On westernmost branch of creek on lower reach, no buffer established, but partial suspension specified. On eastern branch (where temporary bridge needed) a 25 foot transition buffer is specified with partial suspension. On helicopter portion of unit, full suspension is specified next to stream.

Soils

Conflict: Adequate protection be given to soil resource.

Mitigation: Full suspension specified on one streamside area that will be helicopter logged, partial suspension specified on the rest of the unit.

DESCRIPTION OF UNIT ATTRIBUTES/OBJECTIVES

Road Development: (Rounded to nearest 0.1 mile)

0.0 Miles of Specified Road within unit.

0.3 Miles of spur road anticipated.

2 Landings (number)

Timber Attributes:

675 mbf Estimated total volume within entire unit

15 mbf Estimated volume per acre for entire unit

Acres by Volume class within the unit:

- 43 Volume Class 4 (8-20 mbf/acre)

- Volume Class 5 (20-30 mbf/acre)

2 Volume Class 6 (30-50 mbf/acre)

- Volume Class 7 (50+ mbf/acre)

Stand Management Objectives: Even Age Rotation Period: 100 years

Regeneration Method: Natural Anticipated Treatments: Precommercial Thinning

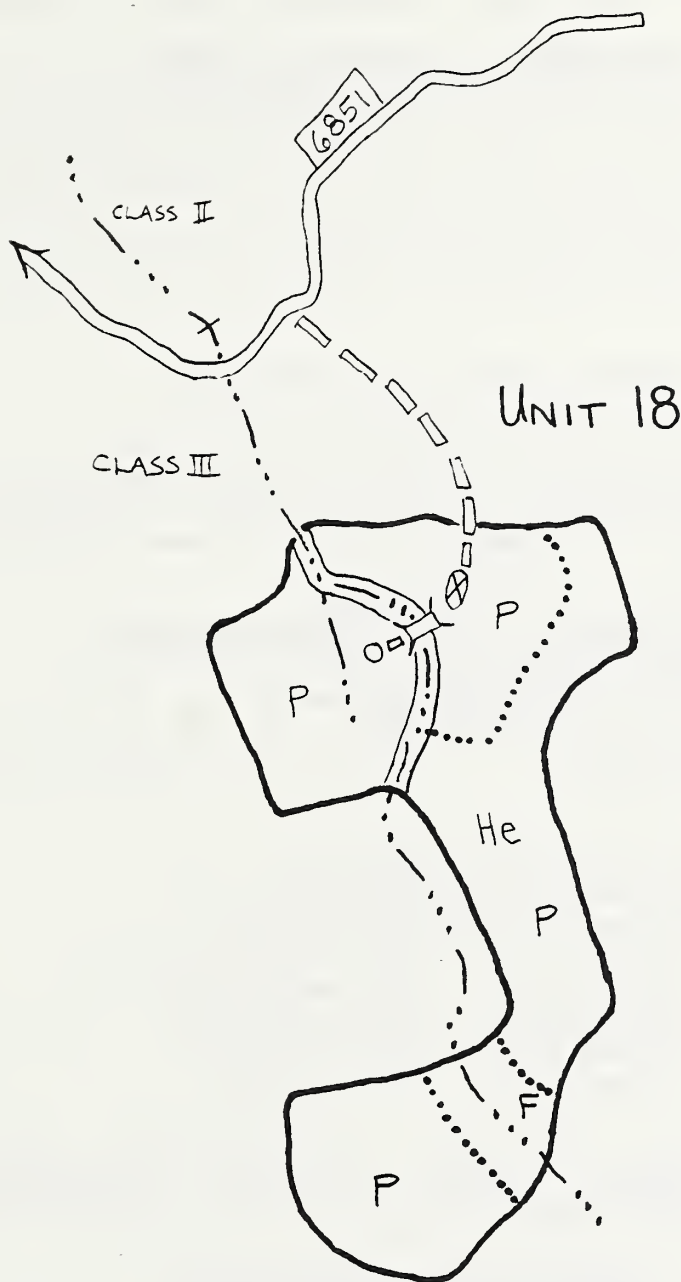
Other Timber Considerations: None

PROPOSED ACTION OR DEVELOPMENT

A short spur off the 6851 road will be used to access the three cable yarding landings. A short log stringer bridge will be needed on the spur to access the last cable landing. The helicopter landing for this unit and unit 21 will be located at the first cable landing in this unit. The average helicopter yarding distance for the timber in the unit will be 0.4 miles. Partial suspension has been specified in all areas except for a small area of full suspension located in the helicopter portion of the unit by a small secondary stream.

UNIT DESCRIPTION

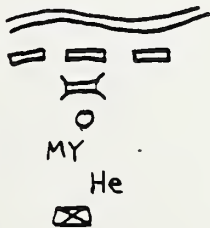
Page 2 of 2



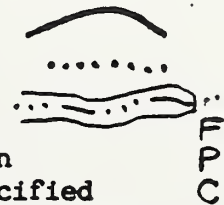
Approximate Drawing Scale: 1" = 660 feet (top of page is north)

Legend:

New Specified Road
Temporary Road
Temporary Bridges
Landings
Mobile Yarder Settings
Helicopter Settings
Helicopter Landing



Unit Boundary
Setting Boundary
Stream Buffer
Full Suspension
Partial Suspension
Cable Yarding Specified



UNIT DESCRIPTIONTIMBER SALE: FrostyUnit Number: 19ACRES 47VCU 524Compartment 138Stand 814 & 815DEVELOPMENT OF FINAL UNIT BOUNDARY

This unit is accessed by the 6851 road and a short spur off the terminus of that specified road. In the DEIS, the cable yarded acreage for the three action alternatives was the same at 30 acres. Helicopter unit I (23 acres) was adjacent to the unit for a total of 53 acres. Field analysis has shown that this helicopter acreage above the cable portion of the unit is not feasible because of rock and steepness and only a portion of the helicopter acreage has been retained. The current acreage is 34 acres cable and 13 acres of helicopter yarding.

RESOURCE CONFLICTS AND MITIGATIONSoils

Conflict: Adequate protection be given to soil resource.

Mitigation: Field analysis determined that part of helicopter unit was not feasible because of presence of rock outcrops and steepness of slope. Oversteepened areas have been eliminated from the unit.

DESCRIPTION OF UNIT ATTRIBUTES/OBJECTIVES

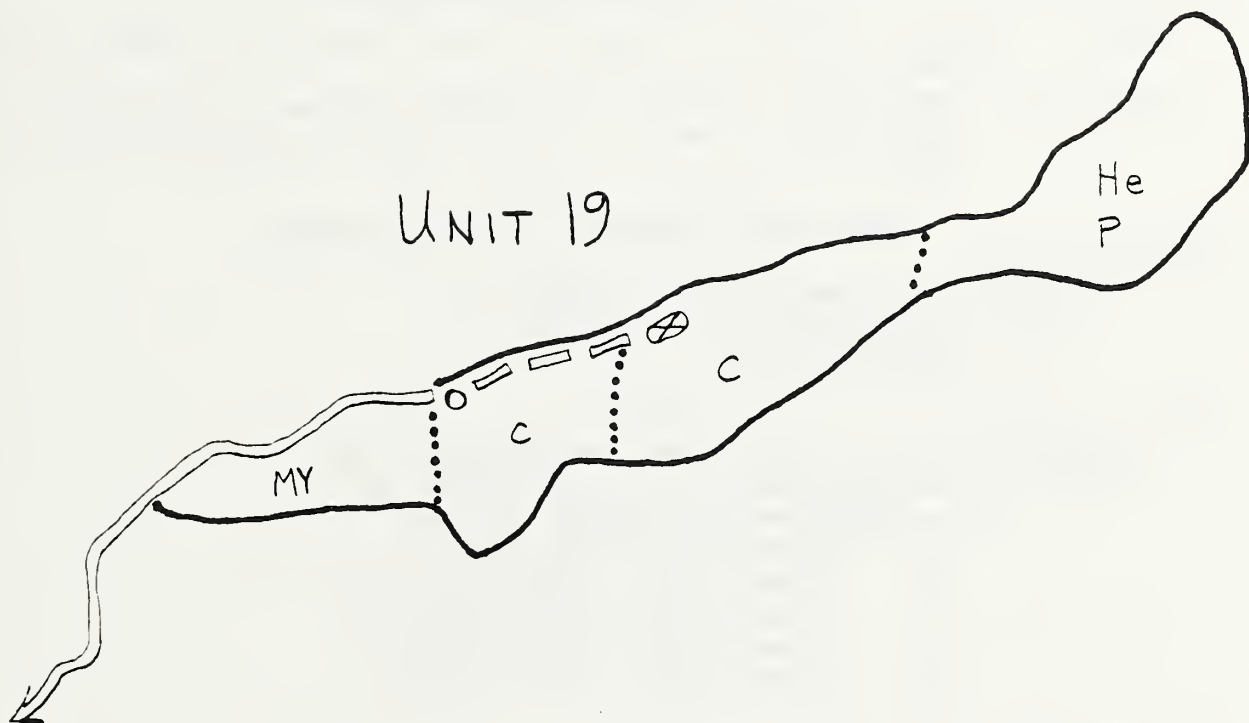
Road Development: (Rounded to nearest 0.1 mile)

0.2 Miles of Specified Road within unit.0.2 Miles of spur road anticipated.2 Landings (number)Timber Attributes:479 mbf Estimated total volume within unit10 mbf Estimated volume per acre for entire unit

Acres by Volume class within the unit:

13 Volume Class 0 (less than 8 mbf/acre)34 Volume Class 4 (8-20 mbf/acre)- Volume Class 5 (20-30 mbf/acre)- Volume Class 6 (30-50 mbf/acre)- Volume Class 7 (50+ mbf/acre)Stand Management Objectives: Even Age Rotation Period: 100 yearsRegeneration Method: Natural Anticipated Treatments: Precommercial ThinningOther Timber Considerations: NonePROPOSED ACTION OR DEVELOPMENT

A short spur off the 6851 road will be used to access the two cable yarding landings within the unit. The last landing in this unit will be used as the helicopter landing for this unit. Average yarding distance for helicopter portion of this unit is 0.4 miles.



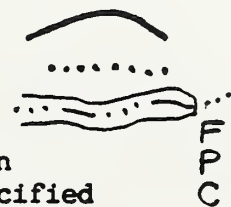
Approximate Drawing Scale: 1" = 660 feet (top of page is north)

Legend:

New Specified Road
 Temporary Road
 Temporary Bridges
 Landings
 Mobile Yarder Settings
 Helicopter Settings
 Helicopter Landing



Unit Boundary
 Setting Boundary
 Stream Buffer
 Full Suspension
 Partial Suspension
 Cable Yarding Specified



UNIT DESCRIPTIONTIMBER SALE: FrostyUnit Number: 20ACRES 22VCU 524Compartment 138Stand 816DEVELOPMENT OF FINAL UNIT BOUNDARY

This unit was displayed as helicopter unit H in the DEIS with 28 acres. Resource concerns have been for the protection of the soil resource. Upper backline of unit was brought down hill to avoid steep slopes.

RESOURCE CONFLICTS AND MITIGATION

Soils/Watershed

Conflict: Adequate protection be given to soil resource and stream adjacent to unit.

Mitigation: Unit will be helicopter logged and will have full suspension. Unit boundary located at slope break of stream and toe of hill slope.

DESCRIPTION OF UNIT ATTRIBUTES/OBJECTIVES

Road Development:

0.0 Miles of Specified Road within unit.

0.0 Miles of spur road anticipated.

0 Landings (number)

Timber Attributes:

296 mbf Estimated total volume within unit

13 mbf Estimated volume per acre for entire unit

Acres by Volume Class within the unit:

<u>1</u>	Volume Class 0 (less than 8 mbf/acre)
<u>21</u>	Volume Class 4 (8-20 mbf/acre)
<u>-</u>	Volume Class 5 (20-30 mbf/acre)
<u>-</u>	Volume Class 6 (30-50 mbf/acre)
<u>-</u>	Volume Class 7 (50+ mbf/acre)

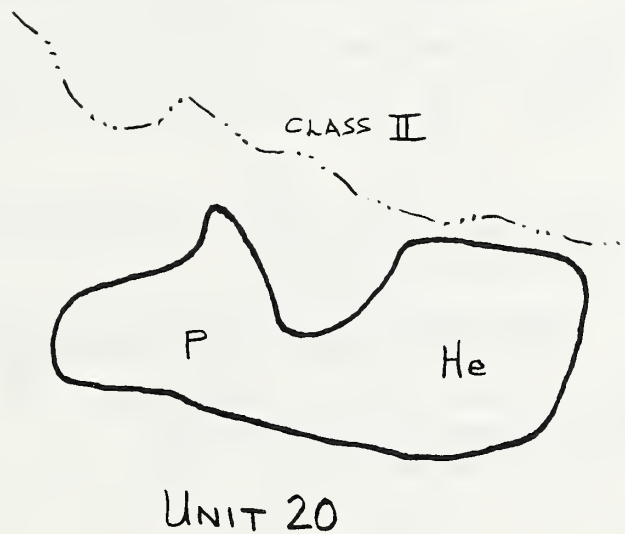
Stand Management Objectives: Even Age Rotation Period: 100 years

Regeneration Method: Natural Anticipated Treatments: Precommercial Thinning

Other Timber Considerations: None

PROPOSED ACTION OR DEVELOPMENT

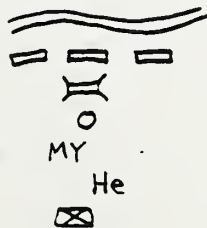
This is a helicopter unit which will not be connected to any road system. The helicopter landing for this unit will be located in unit 13B at the end of the east spur. This will be the same landing used to log the helicopter portions of Unit 13B. The average yarding distance will be 0.5 miles.



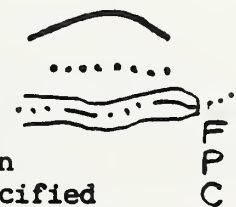
Approximate Drawing Scale: 1" = 660 feet (top of page is north)

Legend:

New Specified Road
 Temporary Road
 Temporary Bridges
 Landings
 Mobile Yarder Settings
 Helicopter Settings
 Helicopter Landing



Unit Boundary
 Setting Boundary
 Stream Buffer
 Full Suspension
 Partial Suspension
 Cable Yarding Specified



UNIT DESCRIPTIONTIMBER SALE: FrostyUnit Number: 21ACRES 63VCU 524Compartment 138Stand 813DEVELOPMENT OF FINAL UNIT BOUNDARY

This unit was displayed as helicopter unit K in the DEIS with 105 acres. There have been some changes to the unit to decrease impacts to watershed values by establishing a leave strip on the eastern portion of the unit near the lake. The unit is now designated as Unit 21 and is still a helicopter unit. The landing used to log this unit will be the first landing in Unit 18. Other resource concerns have been for the protection of the soil resource.

RESOURCE CONFLICTS AND MITIGATION

Stream/Watershed

Conflict: Adequate protection is given to stream on eastern end of unit.

Mitigation: Unit boundary has been modified to eliminate harvest on the alluvial fan on the stream leading into the lake.

Soils

Conflict: Adequate protection is given to the soil resource.

Mitigation: Helicopter yarding will provide for the least amount of disturbance to the soil.

DESCRIPTION OF UNIT ATTRIBUTES/OBJECTIVES

Road Development:

0.0 Miles of Specified Road within unit.0.0 Miles of spur road anticipated.0 Landings (number)

Timber Attributes:

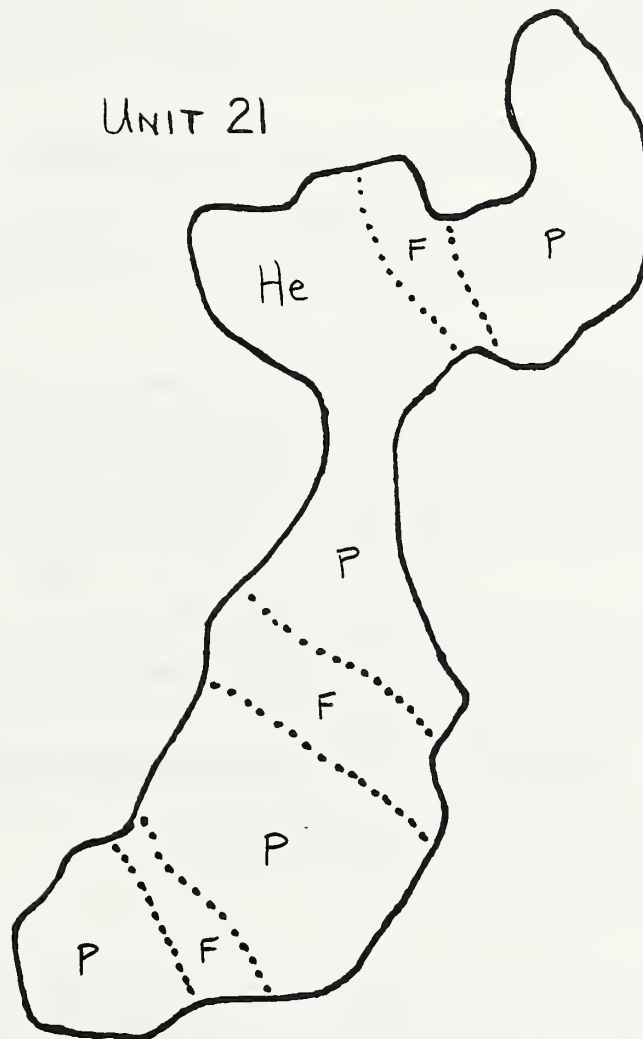
1,082 mbf Estimated total volume within unit17 mbf Estimated volume per acre for entire unit

Acres by Volume Class within the unit:

<u>1</u>	Volume Class 0 (less than 8 mbf/acre)
<u>37</u>	Volume Class 4 (8-20 mbf/acre)
<u>25</u>	Volume Class 5 (20-30 mbf/acre)
<u>-</u>	Volume Class 6 (30-50 mbf/acre)
<u>-</u>	Volume Class 7 (50+ mbf/acre)

Stand Management Objectives: Even Age Rotation Period: 100 yearsRegeneration Method: Natural Anticipated Treatments: Precommercial ThinningOther Timber Considerations: NonePROPOSED ACTION OR DEVELOPMENT

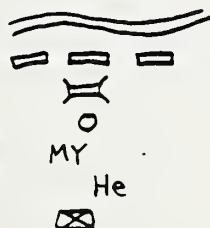
This is a helicopter unit. The landing planned for the logging of this unit is located in Unit 18 at the end of the eastern spur. This landing will also be used for the helicopter portions of unit 18 and 19. Average helicopter yarding distance for the timber within this unit will be 0.8 miles.



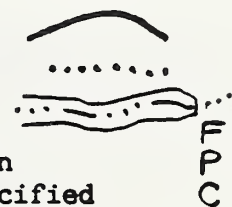
Approximate Drawing Scale: 1" = 660 feet (top of page is north)

Legend:

New Specified Road
 Temporary Road
 Temporary Bridges
 Landings
 Mobile Yarder Settings
 Helicopter Settings
 Helicopter Landing



Unit Boundary
 Setting Boundary
 Stream Buffer
 Full Suspension
 Partial Suspension
 Cable Yarding Specified



UNIT DESCRIPTIONTIMBER SALE: FrostyUnit Number: 22ACRES 10VCU 524Compartment 138Stand 826DEVELOPMENT OF FINAL UNIT BOUNDARY

This unit was displayed as helicopter unit A in the DEIS with 15 acres. There have been no changes to the unit. The major concern with this unit is the impact on the visual values as seen from Frosty Bay and Ernest Sound. Disturbance to watershed and soil values should be minimal with helicopter logging.

RESOURCE CONFLICTS AND MITIGATION

Visuals

Conflict: Area will have some impact on views from Seward Passage.

Mitigation: Helicopter logging (many small trees will be left) and the small size of the unit should not create a significant opening.

Wildlife

Conflict: Area does have some wildlife values to both deer and goat.

Mitigation: The deer values have been given adequate protection in the drainage and the harvest of this unit should not have any significant effect on the deer population.

Mitigation: To prevent disturbance to goats, there will be no activities permitted within the unit between December 1 and July 15.

Stream/Watershed

Conflict: Adequate protection be given to stream near edge of unit.

Mitigation: Boundary will be located on slope break near stream and yarding by helicopter will minimize impact to this unit and stream.

DESCRIPTION OF UNIT ATTRIBUTES/OBJECTIVES

Road Development:

0.0 Miles of Specified Road within unit.

0.0 Miles of spur road anticipated.

0 Landings (number)

Timber Attributes:

141 mbf Estimated total volume within entire unit

14 mbf Estimated volume per acre for entire unit

Acres by Volume Class within the unit:

10 Volume Class 4 (8-20 mbf/acre)

- Volume Class 5 (20-30 mbf/acre)

- Volume Class 6 (30-50 mbf/acre)

- Volume Class 7 (50+ mbf/acre)

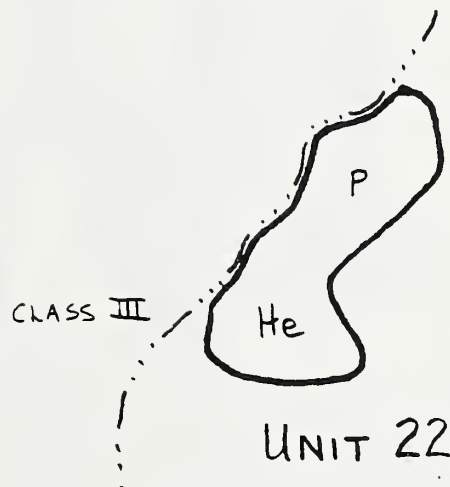
Stand Management Objectives: Even Age Rotation Period: 100 years

Regeneration Method: Natural Anticipated Treatments: Precommercial Thinning

Other Timber Considerations: None

PROPOSED ACTION OR DEVELOPMENT

This is a helicopter unit and the landing planned for the logging of this unit is located in Unit 10A. Average yarding distance will be 0.4 miles.



Approximate Drawing Scale: 1" = 660 feet (top of page is north)

Legend:

New Specified Road

Temporary Road

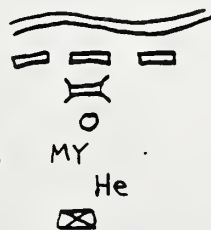
Temporary Bridges

Landings

Mobile Yarder Settings

Helicopter Settings

Helicopter Landing



Unit Boundary

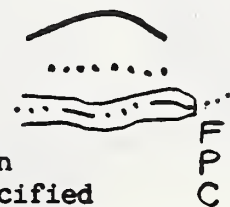
Setting Boundary

Stream Buffer

Full Suspension

Partial Suspension

Cable Yarding Specified



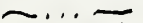





Units on Aerial Photograph

North is Toward Top of Page

Approximate Scale: 1 Inch = 1320 Feet

	Specified Road		Unit Boundary
	Stream Channels		Setting Boundary Within Unit



UNIT DESCRIPTIONTIMBER SALE: FrostyUnit Number: 23 & 24ACRES 8 & 22VCU 524Compartment 138Stand 831 & 832DEVELOPMENT OF FINAL UNIT BOUNDARY

These two units were displayed as helicopter units E (11 acres) and F (38 acres) in the DEIS. The changes to the unit have focused on the timber and soil values. These two units are on a sideslope in an elevated valley above unit 14B. These units are displayed on one page to show the relationship to each other.

RESOURCE CONFLICTS AND MITIGATION

Stream/Watershed

Conflict: Adequate protection given to Class II stream below Unit 24

Mitigation: A 50 foot no-cut buffer established on lower reach of Unit 24.

DESCRIPTION OF UNIT ATTRIBUTES/OBJECTIVES

Road Development:

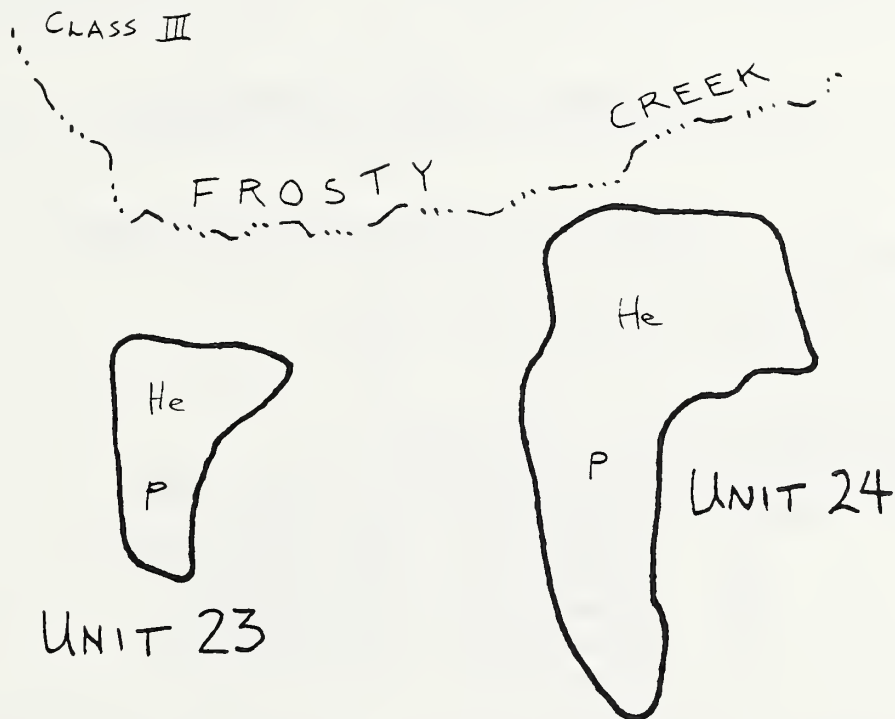
Unit 23	Unit 24	
<u>0.0</u>	<u>0.0</u>	Miles of Specified Road within unit.
<u>0.0</u>	<u>0.0</u>	Miles of spur road anticipated.
<u>0</u>	<u>0</u>	Landings (number)

Timber Attributes:

Unit 23	Unit 24	
<u>70 mbf</u>	<u>282 mbf</u>	Estimated total volume within unit
<u>9 mbf</u>	<u>13 mbf</u>	Estimated Volume per acre for entire unit
Acres by Volume Class within the unit:		
<u>3</u>	<u>2</u>	Volume Class 0 (less than 8 mbf/acre)
<u>5</u>	<u>20</u>	Volume Class 4 (8-20 mbf/acre)
<u>-</u>	<u>-</u>	Volume Class 5 (20-30 mbf/acre)
<u>-</u>	<u>-</u>	Volume Class 6 (30-50 mbf/acre)
<u>-</u>	<u>-</u>	Volume Class 7 (50+ mbf/acre)

Stand Management Objectives: Even Age Rotation Period: 100 yearsRegeneration Method: Natural Anticipated Treatments: Precommercial ThinningOther Timber Considerations: NonePROPOSED ACTION OR DEVELOPMENT

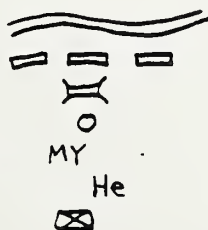
These are both helicopter units and the landing planned for the logging of these units is the second to the last landing in unit 14B. Average yarding distance for Unit 23 is 0.4 miles and for Unit 24 is 0.7 miles.



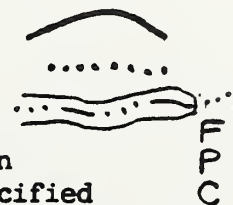
Approximate Drawing Scale: 1" = 660 feet (top of page is north)

Legend:

New Specified Road
 Temporary Road
 Temporary Bridges
 Landings
 Mobile Yarder Settings
 Helicopter Settings
 Helicopter Landing



Unit Boundary
 Setting Boundary
 Stream Buffer
 Full Suspension
 Partial Suspension
 Cable Yarding Specified



UNIT DESCRIPTIONTIMBER SALE: FrostyUnit Number: 25ACRES 21VCU 524Compartment 138Stand 833DEVELOPMENT OF FINAL UNIT BOUNDARY

The unit was included in the DEIS in the helicopter option as Unit L and was 67 acres in size. The main concern associated with this unit was the soil resource and the steepness of slopes. Field review has shown that the lower portions of the unit can be logged with a helicopter. The upper portions of the unit (which have been deleted) were too steep and rocky. Impacts to other resources were minimal.

RESOURCE CONFLICTS AND MITIGATION

There are no significant resource conflicts with the current unit.

DESCRIPTION OF UNIT ATTRIBUTES/OBJECTIVES

Road Development:

0.0 Miles of Specified Road within unit.0.0 Miles of spur road anticipated.0 Landings (number)

Timber Attributes:

440 mbf Estimated total volume within unit21 mbf Estimated volume per acre for entire unit

Acres by Volume Class within the unit:

1 Volume Class 0 (less than 8 mbf/acre)1 Volume Class 4 (8-20 mbf/acre)19 Volume Class 5 (20-30 mbf/acre)- Volume Class 6 (30-50 mbf/acre)- Volume Class 7 (50+ mbf/acre)Stand Management Objectives: Even Age Rotation Period: 100 yearsRegeneration Method: Natural Anticipated Treatments: Precommercial thinningOther Timber Considerations: NonePROPOSED ACTION OR DEVELOPMENT

Unit will be helicopter logged to a landing in unit 17. Average yarding distance will be 0.9 miles. There are no special mitigative measures required.

UNIT 25



Approximate Drawing Scale: 1" = 660 feet (top of page is north)

Legend:

New Specified Road

Temporary Road

Temporary Bridges

Landings

Mobile Yarder Settings

Helicopter Settings

Helicopter Landing



Unit Boundary

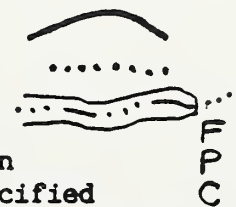
Setting Boundary

Stream Buffer

Full Suspension

Partial Suspension

Cable Yarding Specified



UNIT DESCRIPTIONTIMBER SALE: FrostyUnit Number: 26ACRES 13VCU 524Compartment 138Stand 834DEVELOPMENT OF FINAL UNIT BOUNDARY

The unit was included in the DEIS in the helicopter option as Unit M and was 16 acres in size. The main concern associated with this unit was the soil resource and the distance from a suitable landing. Field review has shown this to be a viable addition to the sale.

RESOURCE CONFLICTS AND MITIGATION

There are no significant resource conflicts with the current unit.

DESCRIPTION OF UNIT ATTRIBUTES/OBJECTIVES

Road Development:

0.0 Miles of Specified Road within unit.0.0 Miles of spur road anticipated.0 Landings (number)

Timber Attributes:

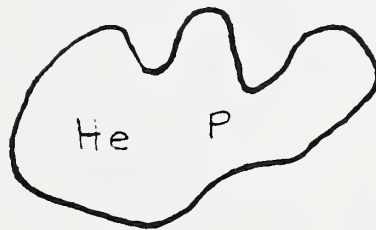
269 mbf Estimated total volume within unit21 mbf Estimated volume per acre for entire unit

Acres by Volume Class within the unit:

1 Volume Class 0 (less than 8 mbf/acre)- Volume Class 4 (8-20 mbf/acre)12 Volume Class 5 (20-30 mbf/acre)- Volume Class 6 (30-50 mbf/acre)- Volume Class 7 (50+ mbf/acre)Stand Management Objectives: Even Age Rotation Period: 100 yearsRegeneration Method: Natural Anticipated Treatments: Precommercial thinningOther Timber Considerations: NonePROPOSED ACTION OR DEVELOPMENT

Unit will be helicopter logged to a landing in unit 17 and will have an average yarding distance of 0.6 miles. There are no special mitigative measures required.

UNIT 26



Approximate Drawing Scale: 1" = 660 feet (top of page is north)

Legend:

New Specified Road

Temporary Road

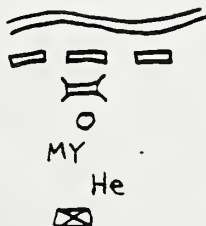
Temporary Bridges

Landings

Mobile Yarder Settings

Helicopter Settings

Helicopter Landing



Unit Boundary

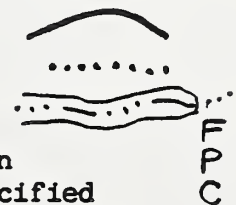
Setting Boundary

Stream Buffer

Full Suspension

Partial Suspension

Cable Yarding Specified





Appendix F

Road Descriptions

ROAD DESCRIPTIONS

The following is a capsulation of the IDT analysis of each of the roads proposed in the preferred alternative, Alternative 3A. This is different than Alternative #3 shown in the Draft EIS because further analysis has required changes for specific mitigation measures and resource concerns. These descriptions are not "road cards," but the results of the IDT analysis of those cards at this point in time. The road cards are part of the planning file and can be seen in that file. They will continue to be used through the layout and harvest of units and the survey and construction of roads described in the Forest Service Manual.

It has to be anticipated that there will be some minor changes to the roads as depicted on these descriptions. It is virtually impossible, without field verification of every section of road, to not have some changes. Exact conformance to preset lines, regardless of values, would not be proper management. Opportunities to not only protect newly discovered situations but also to optimize management intent without changing the environmental impacts have to be anticipated and instituted. The resources, as they are now known and analyzed, have been protected or enhanced to the greatest extent practicable.

If changes and the associated impacts develop which are outside the scope of the impacts envisioned with this Final EIS, additional documentation may be required. The following items are noted in the road descriptions:

Rock Pits: Rock pit locations are tentative but represent the IDT's best estimate of their placement. Regardless of location, each rock pit will require a site plan prior to development. Resource values will be analyzed and mitigative measures will be required where appropriate in each pit development plan.

Visual Concern: Shows areas of road where landscape and visual concerns are high. If relocation of any rock quarries is necessary, the landscape architect will be consulted prior to changes.



Timing Restriction: A timing restriction is required on a segment of Road 6850 beginning in the vicinity of Unit 9, extending to the terminus of Road 6850 in Unit 14B, and on all of Road 54501. No construction activities will be permitted in areas outlined to protect goose nesting activities.

End Haul: End haul is proposed on one segment of Road 6850. Material is hauled away from excavated site to another suitable location. It is used to protect areas on the downhill side of the road during road construction activities.

Specified Roads on Aerial Photograph

North is Toward Top of Page

Approximate Scale: 1 Inch = 2640 Feet

	Specified Road		Stream Channels
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ROAD DESCRIPTION MAP



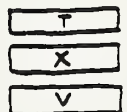
LEGEND

New Specified Road
 Rock Quarry
 Bridge
 Hydro Site



Approximate Scale: 2" = 1 Mile

Road Segments Requiring:
 Timing Restrictions
 Excavation End Haul
 Visual Sensitivity



ROAD NUMBER: 6850ROAD NAME: Frosty

TERMINI: Mile Post 0.0 of Road 6850 begins at the proposed log transfer facility in Frosty Bay and ends in Section 12. Proposed road is approximately 6.0 miles in length.

INTENDED PURPOSE: To provide access for timber management activities and Forest Service administration. Recreation access will be provided between harvest entries. No barricades or other road closure devices will be installed. This is the major road for the Frosty Timber Sale and directly accesses Units 3, 5, 6, 9, 10B, 11, 12B, 13A, 13B, 14A, 14B and helicopter Units 23 and 24. The spur off the end of Road 6850 may in the future serve as the trailhead for a trail into Anan Lake from the south.

CONFLICTS AND MITIGATION

Fisheries/Watershed

Conflict: Frosty Creek fish habitat may be sensitive to increased sediment input, as it currently has a very high bedload of sand due to it's low gradient and the decomposing granitic parent material throughout the drainage.

Mitigation: Standard best management practices apply during road construction. Leave as much vegetative material as practicable along the toe of fill to act as a sediment filter.

Soils

Conflict: High hazard soils were inventoried in the vicinity of Unit 9. (Approximate mile post 2.9 through mile post 3.0.)

Mitigation: Field verification determined that soil hazard was overstated. Because of close proximity to a lake shore for approximately 300 feet, excess excavated material will be end hauled to prevent any rock entering the lake.

Conflict: Moderate hazard soils occur between Units 12 and 13. The concern here was the risk of excavated material directly entering Frosty Creek.

Mitigation: Road 6850 through this area is located on a bench well above a floodplain. Minimal excavation is necessary.

Recreation, Visuals, Wildlife

Conflict: The visual impacts of the road adjacent to Frosty Bay as viewed from boats anchored in Frosty Bay.

Conflict: Severe impacts to beach habitat along Frosty Bay.

Mitigation: Relocate road by increasing grade. Construction was minimized on slope draining into Frosty Bay. New location from MP 0.3 to 1.0 will run behind a ridge break away from the beach and will not be seen from the bay.

Wildlife

Conflict: Road passes through Vancouver Canada goose nesting habitat.

Mitigation: No road construction past station 120+00 (approximate mile post 2.3) to the end of Road 6850 during April 1 through June 15 to avoid disturbance during the goose nesting season.

Hydraulic Sites: (See Road Description Map for corresponding numbers on Road 6850)

Site 1) Major Culvert 167" by 103" and 52 feet long. This structure need not pass fish as there is a high gradient stream section just below this site.

The stream leading into the north pond adjacent to Unit 9 is home to resident trout. Although it is not of sufficient size to warrant a hydraulic site survey, the culvert installed here should provide for passage of trout.

Site 2) Major Culvert 137" by 87" and 46 feet long. This structure need not pass fish as there is a high gradient stream section just above this site.

Site 3) Major Culvert 103" by 71" and 42 feet long. Design for this structure must provide for the passage of fish.

Site 4) Temporary portable bridge. This is the same bridge which will be used to cross Frosty Creek on Road 54501. The bridge must be used last at this site because once sale activities are complete the purchaser will be required to remove half of the bridge. Portable bridges are prefabricated into two halves splitting the bridge lengthwise. One half of the bridge will remain at this site as a trail bridge, saving that construction cost. The other will be transported to the LTF area by the purchaser. The Forest Service will then use it in conjunction with another half bridge to be purchased in the future wherever it is needed on the Stikine Area. A hand rail may be placed on the remaining 8' wide trail bridge as a sale area improvement project if KV funds are available. This remaining 8' wide bridge will provide pickup truck (or easy ATV and motorbike) access for post sale silvicultural activities. The life of the bridge is such that at some time in the future another half bridge could be replaced to provide log truck access for the leave strip between Units 13B and 14B and the remaining helicopter volume north and east of Units 14A and 14B.

ROAD NUMBER: 6851ROAD NAME: Golden Pond

TERMINI: Begins at approximate Mile Post 1.2 of Road 6850 and ends in Section 23. Proposed road is approximately 3.9 miles in length.

INTENDED PURPOSE: To provide access to Units 7,11,15,16,18,19 and helicopter Unit 21 on the Frosty Timber Sale for timber management activities and Forest Service administration. Recreation access will be provided between harvest entries. No barricades or other road closure devices will be installed.

CONFLICTS AND MITIGATION

Fisheries:

Conflict: Spurs off this road cross high hazard soil and may cause sediment problems in some Class 2 reaches of Frosty Creek tributaries.

Mitigation: The spur roads in question were located in Unit 18 which included high hazard soils. This portion of the unit was eliminated from all alternatives, one spur dropped and the other relocated.

There are no other resource conflicts identified by the IDT concerning this road.

Hydraulic Sites: (See Road Description Map for corresponding numbers on Road 6851)

Site 5) Culvert: 81" by 59" by 42' long. Need not pass fish.

Site 6) Culvert: 73" by 55" by 38' long. Need not pass fish as there is a falls just below this site.

Site 7) Culvert: 73" by 55" by 38' long. Need not pass fish.

Site 8) Culvert: 95" by 67" by 42' long. Need not pass fish.

ROAD NUMBER: 54500ROAD NAME: Pass

TERMINI: Begins at approximate Mile Post 0.9 of Road 6850 and ends in Section 21. Proposed road is approximately 1.4 miles in length.

INTENDED PURPOSE: To provide access to Units 1 and 2 on the Frosty Timber Sale for timber management activities and Forest Service administration. Recreation access will be provided between harvest entries. No barricades or other road closure devices will be installed.

CONFLICTS AND MITIGATION:

Wildlife, Visuals

Conflict: Road location shown in DEIS which provided access to this area passed near an eagle nesting tree and generally impacted some beach fringe habitat.

Conflict: Road location shown in DEIS from LTF to Need Point had potential to be seen from Seward Passage.

Mitigation: Relocate road to access Unit 1 and Unit 2 from the top through a pass rather than along the beach. New location (as shown on road description map and photo) should not be seen from the water.

There are no resource conflicts identified by the IDT concerning this new location.

Hydraulic Sites: (See Road Description Map for corresponding number on Road 54500)

Site 10) Culvert, 72" X 46'. This site is Class III and does not require fish passage.

ROAD NUMBER: 54501ROAD NAME: Dog Hair

TERMINI: Begins at approximate Mile Post 2.8 of Road 6850 and ends on the north side of Frosty Creek near the boundary of Unit 10A. Proposed road is approximately 0.1 miles in length.

INTENDED PURPOSE: To provide access to Units 10A and helicopter Unit 22 of the Frosty Timber Sale for timber management activities and Forest Service administration. Motorized recreation access will not be provided following sale activities.

CONFLICTS AND MITIGATION

Stream, Watershed, Wildlife

Conflict: Road crosses Frosty Creek, and therefore improves access to the goat habitat on the north side of the creek.

Mitigation: A temporary portable bridge on log sills will be installed across Frosty Creek. The bridge will be removed after harvest activities have been completed and installed at Hydraulic Site 4 to provide access to Units 14A and 14B and helicopter Units 23 and 24 (see discussion on 6850 Road Description). This will assure that access to the north side of Frosty Creek remains by foot in order to increase the hunting pressure as little as possible on the goat herd to the north.

Wildlife

Conflict: Road passes through Vancouver Canada goose nesting habitat.

Mitigation: No road construction activity on road permitted between April 1 and June 15.

Hydraulic Sites: (See Road Description Map for corresponding number on Road 54501)

Site 9) Temporary portable bridge.

ROAD DESCRIPTION

Page 1 of 1

ROAD NUMBER: 54504 ROAD NAME: Pond View

TERMINI: Begins at approximate Mile Post 2.3 of Road 6851 and ends in Section 23. Proposed Road is approximately 0.8 miles in length.

INTENDED PURPOSE: To provide access to Units 16, 17 and helicopter Units 25 and 26 for timber management activities and Forest Service administration. Recreation access will be provided between harvest entries. No barricades or other road closure devices will be installed.

CONFLICTS AND MITIGATION:

There are no resource conflicts identified by the IDT concerning this road.

Hydraulic Sites: None.

Appendix G

Comments on Draft EIS and Forest Service Response



APPENDIX G

COMMENTS ON DRAFT EIS AND FOREST SERVICE RESPONSE

12-29-89: Draft EIS Published in Federal Register
02-27-90: Final Comment Date

This appendix includes a copy of the letters responding to the Draft EIS and received by 2-27-90 final comment date (see date stamp on first page of each letter). Each comment was then numbered in the margin. Following each letter, the numbered comments are paraphrased, and the Forest Service response is described.

<i>COMMENTING PERSON OR GROUP</i>	<i>DATE RECEIVED</i>	<i>PAGE NUMBER</i>
R.M. Ziesak, Ketchikan Pulp Company	1-29-90	1
Don Cornelius, Alaska Department of Fish and Game	1-31-90	7
Gabrielle E. LaRoche, Division of Governmental Coordination	2-20-90	19
Judith E. Bittner, State Historic Preservation Officer	2-20-90	35
Paul D. Gates, U.S. Department of the Interior	2-21-90	37
Harry E. Wilson	2-26-90	45





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Louisiana-Pacific Corporation

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Ketchikan, Alaska 99901, U.S.A.
Telephone: 907-225-2151
Telefax: 907-225-8260

January 22, 1990

Wrangell Ranger District		
JAN 29 '90		
Inn.		Act.
<input checked="" type="checkbox"/>	Dist. Ranger	
	B.M.A.	
	T.M. Oper.	
	C.R.A.	
	F 2 W	
	Training	
	Engineering	
	Log Acct.	
	Resource Ck	

Mr. Richard K. Kohrt
Tongass National Forest
Stikine Area
P.O. Box 309
Petersburg, AK 99833

Dear Mr. Kohrt:

After a review of the Frost Bay DEIS I have several comments. Ketchikan Pulp Company strongly prefers alternative 2. With the greater sale volume it will be easier to mitigate the added costs required on this sale while maximizing return to the government. } 1

One such added cost item is the removal of the log dump once the sale is completed. It's unclear to me if the bulkhead, etc., is to be removed or just the A-frame itself. Another extra cost item is the timing for blasting in the area. From the ADF&G mitigation measures mentioned in the log transfer decision notice it appears that blasting rock will be limited to certain times of the year. If this is to avoid disturbing bald eagles it's my experience that blasting may take place near eagle nests (at least 1000 feet away) without the eagles being disturbed. This is by making smaller shots that reduce noise and vibration. If this is not allowed it can add a season to the road construction schedule by delaying start up times and reducing the road building season. Further information on this can be obtained from the Ketchikan Ranger District where a similar situation occurred in 1989 near Indian Point. } 2 } 3

Another cost may be the construction of the Forest Service administrative cabin. If this is to be constructed by the purchaser it would be an unnecessary burden. } 4

TL:722.4

The DEIS refers only to a floating camp. Precluding a land based camp will limit the sale to a select few bidders. The option of a land based camp should be available. } 5

Another way to attract the largest number of bidders thereby maximizing return to the government is to make this sale open to all bidders and not limited to those who are SBA qualified. } 6

The helicopter logging option also will work best with alternative 2. With a larger volume available for harvest using conventional techniques the helicopter units can be added and logged even if prices fall somewhat. The helicopter portion should be under a separate contract to allow the contractor greater flexibility in timing harvest of this volume in order to make this logging as economical as possible. } 7 } 8

Specific Comments

Page 4 Chapter 2 -- Alternative 2 - The cumulative effects analysis for this option should be handled the same as the other alternatives with respect to when and how remaining volume will be harvested. } 9

Page 7 Chapter 2 - Normal CFL should not be a category. Cable logging techniques are always improving and I don't believe this category is current with present day cable logging capabilities. } 10

Page 15 Chapter 3 - Yellow Cedar Decline - Has a method been developed to factor this loss of value into the appraisal process? } 11

Page 22 Chapter 4 - The values you have assigned each timber job are to low - for example KPC employees average roughly \$35,000/year. } 12

Finally alternative 2 can be chosen and still conform to the guidelines needed along Seward Passage and at Frosty Bay for anchorage protection, visual concerns, eagle nest buffers and other wildlife concerns. Boundary changes to units along Seward Passage will mitigate these concerns without the loss of 6 MMBF to harvest that adopting alternative 3 would incur. } 13

Thank you for the opportunity to comment.

Sincerely,

R. M. Ziesak

R. M. Ziesak
Planning Forester

cc: O. J. Graham W. J. Begalka

Letter From R.M. Ziesak, Ketchikan Pulp Company

Comment 1:
(paraphrased) The larger sale volume will make it easier to mitigate added costs and maximize the return to the government.

Response 1: We agree.

Comment 2:
(paraphrased) Will the bulkhead or the A-frame at the dump have to be removed after operation have been completed?

Response 2: It is assumed that the entire transfer facility will need to be removed after this entry because of the time between planned entries. However, management needs may alter this assumption.

Comment 3:
(paraphrased) From the mitigation measures mentioned in the LTF permit, it appears that blasting will not be permitted during certain times of the year. From experiences on the Ketchikan Ranger District, this may not be necessary.

Response 3: You are correct; under the terms of the permit there will be restrictions on blasting. To obtain a waiver of these conditions, it will be necessary to consult with ADF&G to obtain their concurrence. Whether or not it can be shown that these restrictions are unnecessary for this area is not known.

Comment 4:
(paraphrased) The cost of the Forest Service administrative cabin would be an unnecessary burden on the purchaser.

Response 4: The administrative/recreation cabin would be constructed by the Forest Service using government funds. The Purchaser of the timber sale would not be required to construct the facility unless compensated.

Comment 5:
(paraphrased) The option to build a land based camp should not be precluded.

Response 5: We agree. The point was to minimize disturbance to the shoreline of Frosty Bay. Changes have been made in the FEIS so that a land based camp can be developed inland, away from the bay.

Comment 6:
(paraphrased)

It would be better to make this an open sale rather than an SBA sale.

Response 6:

Although it was not stated in the DEIS, the sale is now planned to be a Small Business Set Aside Sale (SBA). This means that only a small business concern can purchase the sale, and at least 50% of the domestically processed volume has to be manufactured by a mill that is certified as a small business. However, the sale can be logged by other than a small business concern as long as the volume processing requirement is met.

Comment 7:
(paraphrased)

It would be best to put the helicopter volume with Alternative 2 because the larger amount of high lead volume would amortize the costs of the helicopter volume if prices fluctuate.

Response 7:

The helicopter option was designed to be viable with each of the action alternatives in order to amortize the costs of the helicopter volume regardless of the alternative chosen. It's true that Alternative 2 with the helicopter option would be more economical than Alternative 3 or 3a with the helicopter option. However, in considering both economic and environmental factors, the Forest Service prefers Alternative 3a.

Comment 8:

The helicopter portion should be under a separate contract to allow the contractor greater flexibility in timing harvest of this volume in order to make this logging as economical as possible.

Response 8:

The helicopter volume was added to decrease/amortize added costs of this system with the high lead volume. The road system will be required to economically log some of the helicopter volume. If a separate contract were added at a later date, the future market conditions may not be as favorable and the helicopter volume would probably not be logged.

Comment 9:

Page 4 Chapter 2 -- Alternative 2 - The cumulative effects analysis for this option should be handled the same as the other alternatives with respect to when and how remaining volume will be harvested.

Response 9:

You want the harvest scenario for alternative 2 (next entry in 50 years) to be the same as the other alternatives (next entry in 30 years). If the scenario for alternative 2 were lessened to 30 years, impacts would be more significant. The difference in scenarios was intended to take into account the larger volume that would be harvested in Alternative 2 during this entry (40 mmbf for Alternative 2 vs 34 mmbf for Alternative 3). While this volume difference is not large, the interdisciplinary team decided this scenario would be the most reasonable to use in running the wildlife cumulative effects models and evaluating the alternatives.

- Comment 10:** Page 7 Chapter 2 - Normal CFL should not be a category. Cable logging techniques are always improving and I don't believe this category is current with present day cable logging capabilities.
- Response 10:** You are right about changing capabilities. One of the biggest problems in maintaining data bases is the ever changing nature of not only definitions, but the need for other definitions/delineations. Despite these changes, the normal CFL category is still valid today for planning purposes.
-
- Comment 11:** Page 15 Chapter 3 - Yellow Cedar Decline - Has a method been developed to factor this loss of value into the appraisal process?
- Response 11:** No. Appraisal information used in today's appraisal are a reflection of costs/selling values collected in a previous year with quarterly updates. The direct loss of value attributed to Yellow Cedar Decline is not a factor that can be discerned from the appraisal values.
-
- Comment 12:**
(paraphrased) Page 22 Chapter 4 - The values you have assigned each timber job are too low for example KPC employees average roughly \$35,000/year.
- Response 12:** We used a standard value that was also used in the Supplemental EIS for the APC Long Term Timber Sale. Though KPC employees may average a higher salary, we stand by the \$23,000 figure as an average for all jobs, temporary as well as permanent, in all work sectors.
-
- Comment 13:**
(paraphrased) Alternative 2 can still be chosen as it will conform to all pertinent guidelines and direction.
- Response 13:** Alternative 2 is a good alternative. However, Alternative 3 was identified as the preferred alternative in the DEIS because it provided the best mix of products, services, and resource protection. Further modifications were made to Alternative 3 from the Draft EIS to form Alternative 3a, the preferred alternative in the Final EIS.
-

MEMORANDUM

State of Alaska

TO: Gabrielle LaRoche
Project Coordinator
Division of Governmental Coordination
Office of Management and Budget
Juneau

DATE: January 25, 1990
AK891227-10J
TELEPHONE NO: 772-3801

FROM: Don Cornelius DC
Area Habitat Biologist
Department of Fish and Game
Petersburg

SUBJECT: Frosty Bay DEIS

The Department of Fish and Game has reviewed the Draft EIS for the Frosty Bay Timber Sale on the Cleveland Peninsula. In general, we feel the level of detail on fish and wildlife resources and impacts to these resources provided in this document is inadequate to fully address the proposed action. The document fails to deal with TLMP directives to identify retention to provide for the long term needs of old-growth dependent species, there is no meaningful cumulative effects analysis, mitigation for wildlife impacts is minimal with the only "mitigation" for the major species of concern consisting of monitoring impacts to Vancouver Canada geese, there is no identified monitoring of the effects of the proposed activity on fish and wildlife, and the subsistence discussion does not adequately deal with the issue.

More detailed comments regarding this document are as follows:

Retention:

The Amended 1985-86 Tongass Land Management Plan (TLMP) directs the Forest Service to:

"1. Define and identify areas of important wildlife and fish habitat that are eligible for management under the retention provision.

2. Delineate areas retained in the context of land units that are fundamental to all levels of planning on the Tongass National Forest.

3. Formalize implementation of the retention provision in project planning and implementation through the NEPA process and

4. Maintain a complete and current inventory of all habitats managed under retention prescriptions."

The complete process for identification of retention includes identification of Wildlife Habitat Management Units (WHMU's), and Fish Habitat Management Units (FHMU's), completion of a Management Area Analysis and finally designation of retention areas at the project planning level.

Wrangell Ranger District		
JAN 31 '90		
Init.	Dist. Ranger	Act.
OK	E.M.A.	
	T.M. Oper.	
	C.F.A.	
	F.S.W.	
	Planning	
	Engineering	
	Log. Acct.	
	Resource Ck	
	Stevens	

January 25, 1990

This direction is clear and yet the Frosty Bay DEIS fails to deal with this obligation. In fact, on page 2-5, the "harvest scenario" for the preferred alternative "assumes second entry in 30 years to take one-third remaining volume, third entry in 60 years to take second one-third, fourth entry in 90 years to take final one-third". Clearly there is no long range plan to provide retention for the needs of old-growth dependent species in the Frosty Timber Sale area.

3

Prior to the selection of any units we believe the Forest Service needed to conduct an interagency review of the planning area to identify which areas were most important for the protection of wildlife resources. Although the Forest Service did consult with the Department regarding the proposed units after they were initially drawn on maps, several of the key areas we requested be deleted (unit 10-A and a portion of unit 9) are scheduled to be logged under the preferred alternative. The designation of retention areas was not included in the agenda for that meeting. This entire process constitutes a serious breakdown in the system as established under TLMP.

4

Additionally, the arrangement of units in the planning area seriously restricts the ability of the Forest Service to provide for the needs of species such as owls and goshawks which require large tracts of old-growth habitat. This spacial configuration could lead to localized extinction of some species without consideration for this impact.

5

Pursuant to the Fish and Wildlife Coordination Act, we request Unit 10A and a portion of unit 9 described later be deleted from the final preferred alternative, and a joint interagency planning effort to identify retention be completed prior to completion of the FEIS. This process should include representatives of the USFWS to address the Vancouver Canada goose issue. Some unit changes may be needed after needed retention areas are designated. This action is needed to correct the omissions in the planning process to date.

6

Alaska Coastal Management Plan Consistency

An important coastal resource which is described as nesting in high densities in the sale area is the Vancouver Canada Goose. While limited information is currently available on the impacts of logging on this species, the behavior of rearing geese indicates this species will be adversely impacted by the proposed activity, an issue that will be addressed in our ACMP review of the FEIS.

7

Goslings depend on vaccinium in old-growth for escape cover

January 25, 1990

from predators and feed extensively on skunk cabbage at this stage of their life cycle. The best habitat has greater than 30 percent vaccinium understory and 20 percent skunk cabbage understory. Fifteen to twenty years after logging and for the following 150 to 250 years, this cover and food source will no longer exist in second growth forests. A goose model has been developed to assist the Forest Service in addressing this issue, but for some reason, it was not used in this EIS. We believe this to be a serious omission. Statements such as "adult and juvenile geese will probably use young clearcuts for foraging", that "AHMU guidelines would protect most of the existing goose habitat" and that "other mitigation measures could be taken to improve nesting habitat" cannot be substantiated. The need to protect this old-growth dependent coastal resource is further justification for identifying adequate retention in this sale area.

8

At the map scale provided, it appears that portions of units 9, 10, 11, 12 and 13 may be inconsistent with the Alaska Coastal Management Program because of impacts to goose nesting habitat. Portions of other units may be determined to be inconsistent when better maps are provided. Of particular concern in assessing these units, is the lack of protection afforded to this habitat by the class II AHMU prescriptions. The importance of this high density goose nesting habitat is justification for significantly increasing the width of buffer strips.

9

We request that unit cards be included in the FEIS to facilitate completion of our ACMP consistency review of this timber sale and that the cards include buffers along the riparian habitat in units 10, 11, 12 and 13. These buffers need to be extended to a minimum of 300 feet, the portion of unit 9 west of the road needs to be deleted and the road and unit boundaries be kept at least 500 feet from the pond in this unit. While these figures seem large, 300 feet is only one eighth of the distance used in the goose model to assess impacts to Vancouver Canada geese.

10

11

We are further concerned about the failure to include land otter, another old-growth dependent coastal resource (for denning sites) in the list of MIS included in the environmental effects section. This is another species which we previously requested be included as a MIS that appears to be at risk in this sale area. For all of the MIS including land otter, the narrative needs to be expanded to provide a more thorough understanding of the cumulative effects of the proposed action as required under NEPA.

12

The preferred alternative for the Sale identifies construction of two fords across Frosty Creek as an option

13

to access units across the stream. While timing of construction and use are proposed in the DEIS, we feel this alternative is inconsistent with the ACMP because of impacts to water quality which would result. We request this proposal be eliminated from the FEIS.

} 13

Stream Crossings/Inwater Work

Our review of the FEIS will also consider the impacts of constructing stream crossing over anadromous and resident fish streams and their tributaries. The level of information we review for stream crossings must ultimately be sufficient for the Department of Fish and Game to issue Title 16 authorization for this type of activity.

While we recognize the Forest Service and State are in disagreement regarding our authority to issue Title 16 permits on Federal lands, the Forest Service has agreed to provide us with the information we need to assess the adequacy of stream crossings and issue Title 16 permits. The Forest Service has also indicated they will work with the State to reconcile any differences in interpretation regarding what is needed to protect fishery resources at each crossing site.

} 14

We request that information regarding types of structures to be used, construction techniques, expected timing for in-water work, a report of habitat conditions by a fisheries biologist, and any proposed mitigation measures be provided to the Department of Fish and Game a minimum of 30 days prior to the date work is scheduled to begin. This level of information needs to be provided for activities which affect the bed or banks of anadromous fish streams.

We would prefer to phase this portion of the ACMP review into the project implementation stage.

Monitoring

As we previously indicated, no specific monitoring of effects of the proposed activity is identified in the DEIS. However, unspecified short term monitoring is proposed under the mitigation section to evaluate impacts to Vancouver Canada geese. This is not mitigation and needs to be moved into the monitoring section with inclusion of more detail regarding what will be done. It is also important that the Forest Service make a long-term commitment to this effort as expected impacts may be greatest when the second growth forest canopy closes over.

} 15

Subsistence

The sections dealing with subsistence are woefully inadequate and fail to document the results of studies completed for communities which may be affected by the logging activities. Reports to the Communities of Thorne Bay, Coffman Cove and Meyers Chuck from the Tongass Resource Use Cooperative Survey (TRUCS) are available. These reports, prepared by the University of Alaska, Anchorage ISER in cooperation with the USFS, were published on September 20, 1988. In addition, information provided by the referenced Wrangell Harvest Study (Cohen, 1989) is not included in the document.

16

It is extremely important to review subsistence maps for these communities to evaluate the degree of overlap between subsistence use areas and proposed harvest units. This information is needed to complete the portion of our Alaska Coastal Management Program review under the Subsistence standard and to comply with the mandated, ANILCA 810 evaluation. The current draft of the Frosty Bay EIS is insufficient for these purposes. Rob Bosworth of the Subsistence Division of the Department of Fish and Game (465-2629) is available to assist the Forest Service in this analysis. This analysis also needs to consider the subsistence use of Vancouver Canada Geese which nest in the sale area, but overwinter and are harvested for subsistence purposes, in other parts of Southeast Alaska.

17

In summary, it is apparent that considerable effort is needed to complete an acceptable FEIS. We are prepared to assist the USFS in identification of retention areas and to provide any other resource information needed.

Thank you for the opportunity to comment.

cc: R. Reed, ADFG, Juneau
R. Bosworth, ADFG, Juneau
J. McAllister, ADNR, Juneau
B. Janes, ADEC, Juneau
R. Humphrey, USFS, Petersburg
— K. Kohrt, USFS, Wrangell



Letter From Don Cornelius, Alaska Department of Fish and Game

- Comment 1:**we feel the level of detail on fish and wildlife resources and impacts to these resources provided in this document is inadequate to fully address the proposed action.
- Response 1:** The level of detail in any document will never satisfy everyone. The difference between extraneous information, which would lengthen reviews, and additional beneficial data, is a fine line which is difficult to identify. While the Forest Service has developed considerably more data that is available for review in the Frosty Planning Files, we believe that the information included in the Draft EIS provided the reviewer with enough data to make sure that all relevant factors are considered, that consequences are adequately displayed, and that no value(s) are being neglected or modified more than anticipated.
- At the same time, we agree that it would be useful to display the proposed actions in greater detail. As a result, unit and road descriptions for each harvest unit and road segment have been included in the Final EIS.
-
- Comment 2:** The document fails to deal with TLMP directives to identify retention to provide for the long term needs of old-growth dependent species, there is no meaningful cumulative effects analysis, mitigation for wildlife impacts is minimal with the only "mitigation" for the major species of concern consisting of monitoring impacts to Vancouver Canada geese, there is no identified monitoring of the effects of the proposed activity on fish and wildlife, and the subsistence discussion does not adequately deal with the issue.
- Response 2:** Many concerns are raised by this statement. Each will be dealt with separately.
- Retention:** The location of retention areas for each alternative was assigned by Forest Service biologists for this entry based on on-the-ground surveys, habitat suitability models, and additional known habitat needs. Minimum retention areas were identified according to the percentages described in the Forest Plan. All alternatives provide more retention than the minimum required in the current Forest Plan and the Forest Plan Revision. The Final EIS includes retention maps, tables, and narrative for each Alternative.
- No meaningful cumulative effects analysis:** Cumulative effects were analyzed for a number of management indicator species in the Frosty Study Area, namely deer, marten, black bear, Vancouver Canada goose, and Bald eagles. Forest Service biologists used habitat suitability index (HSI) models to predict the change in populations for deer and marten in the Draft EIS. The Final EIS also includes an HSI analysis for black bear. These predictions were made not only for the first timber harvest entry, but for future entries over the 100 year rotation, as described in the Forest Plan. The following assumptions were made in order to run the models:
- The second entry would occur in 50 years in Alternative 2 and in 30 years in Alternatives 3, 3a, and 4.

- As described in the Forest Plan, the Forest Service biologist assumed that all operable commercial forest land would be harvested over a 100 year rotation except for the percentage of the area set aside for retention.

If this question is also intended to ask which stands would be harvested during each entry, and how many entries would be made to harvest all of the timber, we don't know how future land managers will address these questions.

Mitigation for wildlife minimal, with mitigation for Canada goose consisting mainly of monitoring: In preparing the Draft EIS, Forest Service biologists identified retention areas, including several riparian areas, but we did not display them in the document. They are displayed in the Final EIS. The retention areas will mitigate most of the potential impact on riparian species. In addition, the Final EIS includes the following measures:

- timing restrictions on road building activity that might interfere with goose nesting
- placement of additional retention in beach fringe to minimize impact on beach fringe species

We agree that the goose study should be listed under monitoring rather than mitigation. Monitoring will help determine if significant impacts have occurred and whether further mitigation measures are needed here or on other areas with similar Canada goose habitat.

Subsistence is not adequately considered: We agree. The discussion of impact on subsistence use of resources has been expanded considerably in this Final EIS.

Comment 3:
(paraphrased)

No long range plan to provide for retention requirements.

Response 3:

See response 2.

Comment 4:
(paraphrased)

Would like to have an interagency review of units. Units requested for deletion (portion of Unit 9 and Unit 10-A) are in preferred Alternative. Retention has not been delineated so entire process is not according to TLMP.

Response 4:

The retention question is addressed in Response 2. The IDT discussed Units 9 and 10A at great length. Parts of both units have been dropped from the preferred alternative. Several other units or parts of units have also been dropped at ADFG's request. The IDT did not concur with ADFG that the wildlife resource values in the rest of Units 9 and 10A warranted their being dropped from the preferred alternative.

- Comment 5:**
(paraphrased) Arrangement of units restricts ability to provide for the needs of species such as owls and goshawks which require large tracts of old-growth habitat. This spacial configuration could lead to localized extinction of some species without consideration for this impact.
- Response 5:** Inventories and field information do not indicate this to be a problem. As can be seen in Map 3-10 in the Final EIS, the Frosty study area currently has very few large contiguous blocks of old growth. This area is a natural mosaic of high and low volume old growth and muskegs. While one of the few large blocks of old growth would be entered in all of the alternatives, other large blocks in the study area would be left intact with this entry.
-
- Comment 6:**
(paraphrased) Request Unit 10A and portion of unit 9 be deleted from preferred alternative and retention be identified jointly with ADF&G and USF&WS to address the Canada goose issue. Some changes may be needed after retention areas are designated.
- Response 6:** Some of Units 9 and 10A have been deleted. Also see Response 2 and 4.
-
- Comment 7:**
(paraphrased) The limited information available on the behavior of rearing Canada geese indicates that the proposed timber sale will have adverse impacts on this species.
- Response 7:** We realize that there are some unknowns on this issue with any of the action alternatives. We believe the impacts associated with the Alternative 3a are not significant and will check the assumption by monitoring goose populations as proposed in the Draft EIS. Planning for the monitoring effort has already begun. Baseline data will be collected for two nesting seasons before harvest activities begin. Preliminary results indicate there are 5-10 nesting pairs of geese and 40-60 moulting, nonbreeders. In addition to the protection afforded by applying AHMU guidelines as described in the Draft EIS, buffers have been increased along some units and timing of road construction and harvest activities has been restricted to protect geese during the nesting period.
-
- Comment 8:**
(paraphrased) A goose model has been developed to assist the Forest Service in addressing the goose issue, but it was not used in this Draft EIS. Statements about measures taken to protect the rearing geese cannot be substantiated.
- Response 8:** A goose HSI model is currently being developed, but the lack of information on geese makes it difficult to complete or verify the model. At this time, the Forest Plan Revision team is not using the goose model either. We anticipate that information collected in the monitoring study will help develop the model. Also see Response 7.
-

Comment 9:
(paraphrased)

At the map scale provided it appears that portions of units 9, 10, 11, 12 and 13 may be inconsistent with ACMP because of impacts to goose nesting habitat. There is sufficient reason to increase the size of buffer strips.

Response 9:

Unit and road descriptions have been included in the Final EIS which will better show the width of buffer strips as determined by the AHMU (Aquatic Habitat Management Unit) handbook. The Vancouver Canada goose is not a threatened or endangered species, and adequate protection measures have been proposed with the preferred alternative. TLMP direction states that in LUD IV areas, 25% of high concentration waterfowl areas would be retained. The information we have shows that this requirement is met in all alternatives, and 85 percent of the known high density goose nesting areas would be protected with the preferred alternative. The exact extent of the goose nesting areas may be impossible to determine. A biologist has been hired to collect the baseline data for the goose study during the 1990 nesting season. Also see Response 7.

Comment 10:
(paraphrased)

Requests that unit cards for units 10, 11, 12 and 13 be included to show buffer strips.

Response 10:

We agree. Unit and road descriptions have been included in the Final EIS.

Comment 11:
(paraphrased)

Buffers need to be extended to a minimum of 300 feet on units 10, 11, 12 and 13. A portion of unit 9 west of the road needs to be deleted and the road and unit boundaries be kept at least 500 feet from the pond in this unit.

Response 11:

Unit and road descriptions have been included in the Final EIS for the preferred alternative. They show the proposed buffers in greater detail than in the Draft EIS. Although these buffers are only 100 feet wide in most places along main Frosty Creek, we feel that this is adequate to protect nesting geese because their habitat rarely extends farther than this from the creek. Where necessary, especially for wind firmness, these buffers will be extended. In the preferred alternative, that part of Unit 9 west of the road has been deleted. Unfortunately, it is not possible to move the road any farther from the two ponds in this unit because of a series of small bluffs. Also see Response 7.

Comment 12:
(paraphrased)

The ADFG is concerned about the effects of the proposed action on the land otter and that this should be included as a MIS (management indicator species) because it appears to be at risk in this sale area.

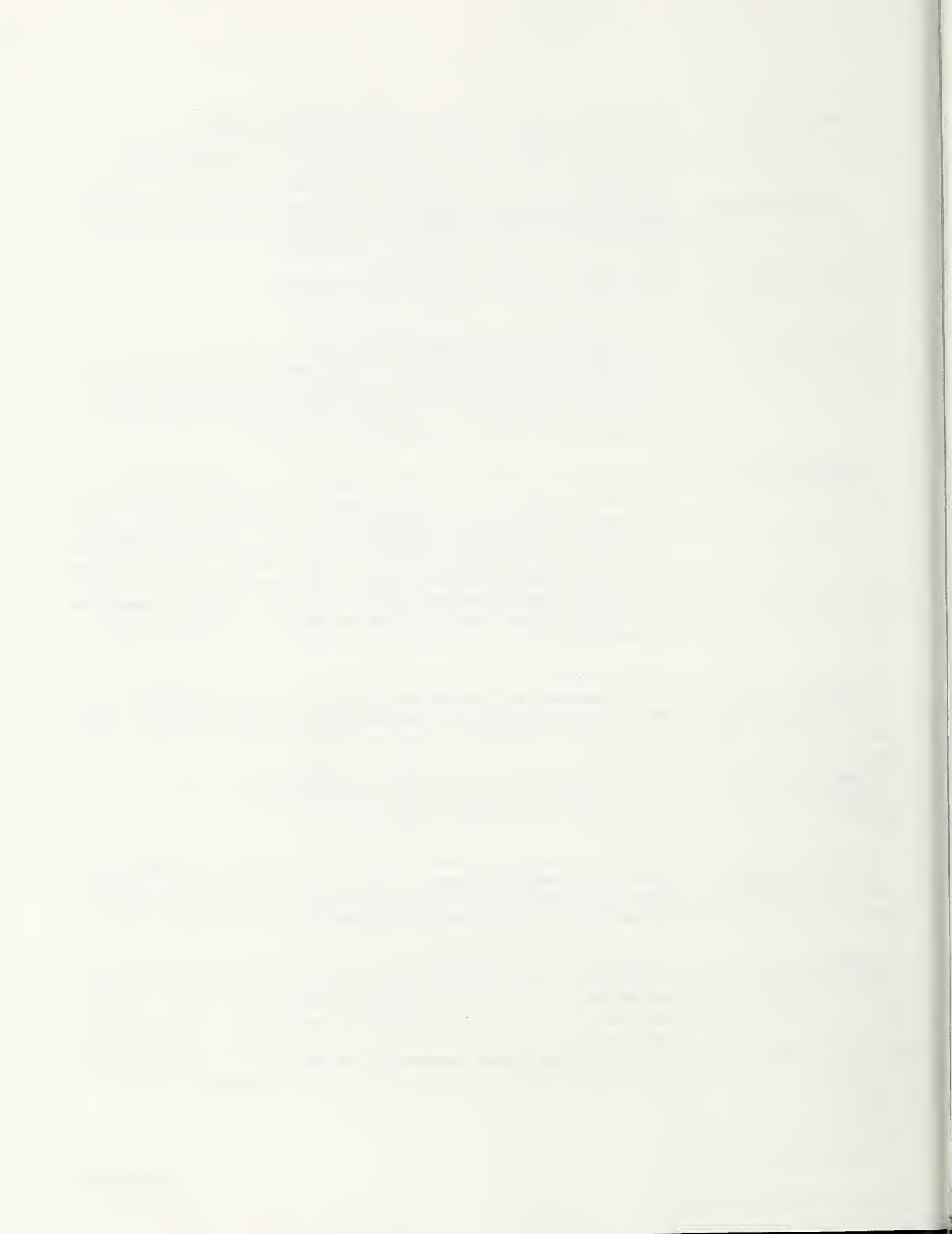
Response 12:

Most otter use occurs within 100 feet of saltwater or streams. There is almost no harvest proposed within this zone, so no significant impact is anticipated on otters.

Comment 13:
(paraphrased)

Request that the construction of two fords of Frosty Creek is inconsistent with ACMP because of impacts to water quality which would result.

- Response 13:** The option of using a ford has been dropped from consideration.
-
- Comment 14:**
(paraphrased) The ADFG will require more information on the adequacy of stream crossings to enable them to issue Title 16 permits for the stream crossings on this project. Differences of opinion exist between the two agencies (ADF&G and USDA-FS) as to the regard of the authority of the state to issue permits.
- Response 14:** The Forest Service will work with the state on this issue.
-
- Comment 15:**no specific monitoring of effects is identified in the Draft EIS. However, unspecified short term monitoring is proposed under the mitigation section to evaluate impacts to Vancouver Canada geese. This is not mitigation and needs to be moved to the monitoring section with inclusion of more detail regarding what will be done. It is also important to make a long-term commitment to this effort because impacts may be greatest when the second growth canopy closes over.
- Response 15:** See Response 2, Mitigation. Monitoring of every clearcut on every timber sale is not necessary or practical. There are several studies that have already been conducted or are under way to assess the effects of timber harvest, including older second growth stands, on various species of wildlife. We are just beginning to manage second growth timber for wildlife as well as fiber production. We expect that any necessary second growth management will be implemented in this area as well. Since this is an evolving field, and most management of second growth stands does not occur until they are 10-15 years old, it is difficult to be specific at this time as to what measures will be implemented.
-
- Comment 16:**
(paraphrased) Subsistence discussion is inadequate and fails to document the results of studies completed for the Tongass Resource Use Cooperative Survey (TRUCS). In addition, the Wrangell Harvest Study by Cohen in 1989, is not included in the document.
- Response 16:** Both of the surveys you mention have been reviewed but neither indicate any substantial use other than that mentioned in the Draft EIS.
-
- Comment 17:**
(paraphrased) An analysis needs to be conducted to evaluate the overlap of subsistence use and harvest units. Analysis also needs to consider the subsistence use of Vancouver Canada geese which nest in the area, but overwinter and are harvested elsewhere. Rob Bosworth of ADFG is available to assist the Forest Service.
- Response 17:** An intensive review has been made of all relevant subsistence and harvest studies and documents and the use in the Frosty study area appears to be from none to very little. Previous research on Vancouver Canada geese indicates that the entire population breeds and winters in Southeast Alaska and the Pacific Northwest. There has never been any authorized subsistence harvest of geese in Southeast Alaska. Only sport hunting of geese is authorized in this area. This is not expected to change, even if subsistence harvest remains under Federal management.
-



STATE OF ALASKA

OFFICE OF THE GOVERNOR

OFFICE OF MANAGEMENT AND BUDGET DIVISION OF GOVERNMENTAL COORDINATION

STEVE COWPER, GOVERNOR

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REGISTERED MAIL
RETURN RECEIPT
REQUESTED

February 14, 1990

Mr. Ronald R. Humphrey
Forest Supervisor
U.S. Forest Service
Tongass National Forest
Stikine Area
P.O. Box 309
Petersburg, AK 99833

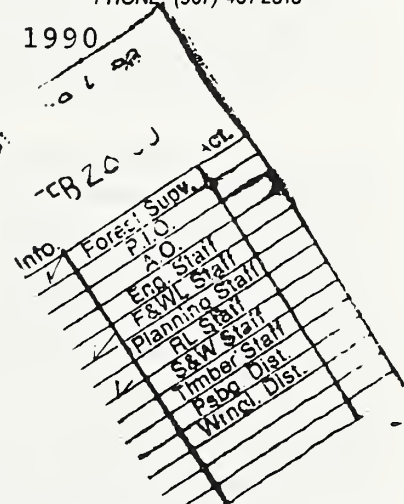
Dear Mr. Humphrey:

SUBJECT: FROSTY BAY TIMBER SALE, DRAFT ENVIRONMENTAL IMPACT
STATEMENT; STATE I.D. NO. AK891227-10J

The State of Alaska has completed its review of the draft environmental impact statement (DEIS) for the Frosty Bay timber sale. This is a U.S. Forest Service sale located on LUD IV lands on the Cleveland Peninsula. It includes 22 million board feet and 14 miles of road on 1,133 acres. Comments regarding the consistency of the proposed federal action with applicable standards of the Alaska Coastal Management Program (ACMP) are provided pursuant to the Coastal Zone Management Act (CZMA - 16 U.S.C. 1451) and associated regulations (15 CFR 930). Issues not related to federal consistency are discussed beginning on page 3 of this letter.

ACTIONS ON FEDERAL LAND WHICH DIRECTLY AFFECT COASTAL ZONE

The State recognizes that the CZMA excludes federal land from the coastal zone. However, proposed activities on federal land which would directly affect the coastal zone are required by the CZMA to be "consistent to the maximum extent practicable" with approved state coastal management programs. Our intent in providing consistency comments at the draft stage is to assist you in the preparation of a federal consistency determination accompanying the Final Environmental Impact Statement (FEIS) and Record of Decision (ROD). When the FEIS and ROD are released to the



public, the State will render a conclusive finding per 15 CFR 930.41.

The State's review of the draft considered the proposal's consistency with applicable standards of the ACMP, including Timber Harvesting and Processing (6 AAC 80.100), Habitats (6 AAC 80.130), Air, Land and Water Quality (6 AAC 80.140) and Recreation (6 AAC 80.060). These comments are based on review by the Departments of Fish and Game (DFG), Natural Resources (DNR), and Environmental Conservation (DEC).

Although the level of detail displayed in the draft may satisfy NEPA requirements for disclosure of environmental impacts associated with the proposed action, the lack of site specific information and unit design for each of the harvest areas which could directly affect the coastal zone makes it difficult to agree, at this juncture, that the proposal would be consistent to the maximum extent practicable with applicable ACMP standards. The State encourages the Forest Service to include harvest unit cards in the FEIS. This will enable us to focus our review at the individual unit level and make a more detailed ACMP analysis of your consistency determination. We are hopeful that many of the State's concerns will be addressed at that time. However, where issues remain unresolved, we request that the process recently developed for State participation in phased decisionmaking be followed.

In summary, where agreement cannot be reached regarding ACMP consistency of harvest units and roads displayed in future FEISs or EA/FONSIs, the State will be given the opportunity to jointly participate in field reviews of questioned units or roads with the Forest Service. The State also will review the final road location cards or harvest unit cards as actually laid out (Phase II). If disagreement still exists regarding consistency of such units or roads, the State will consider other remedies.

Additionally, the State requests that the process for post-layout review be applied to activities which require additional State agreement, such as planned activities in fish streams.

Please note that facility and activities on State tidelands and uplands resulting from this timber sale are and will continue to be evaluated on a case-by-case basis. Agreement with this consistency determination does not obligate DNR to issue authorizations pursuant to AS 38.05, not does it supersede statutory obligations thereunder.

CONSISTENCY OF THE PROPOSED ACTION WITH ACMP STANDARDS

Upland Habitat

An important coastal resource which is described as nesting in high densities in the sale area is the Vancouver Canada goose. While limited information is currently available on the impacts of logging on this species, the behavior of rearing geese indicates this species may be adversely impacted by the proposed activity.

At the map scale provided, it appears that portions of units 9, 10, 11, 12 and 13 may not be "consistent to the maximum extent practicable" with the ACMP because of impacts to goose nesting habitat. Of particular concern in assessing these units is the lack of protection afforded to this habitat by the class II AHMU prescriptions. The importance of this high density goose nesting habitat may be justification for significantly increasing the width of buffer strips. 4

In addition to requesting that unit cards be included in the FEIS to facilitate completion of our ACMP consistency review of this timber sale, we would like to suggest that the cards include buffers along the riparian habitat in units 10, 11, 12 and 13. We understand that a goose model has been developed and we are available to assist the Forest Service in applying this model to determine appropriate buffers. 5

We are further concerned about the omission of land otter, another old-growth dependent coastal resource (for denning sites) in the list of MIS included in the environmental effects section. This is another species which we previously requested be included as a MIS that appears to be at risk in this sale area. For all of the MIS, including land otter, the narrative needs to be expanded to provide a more thorough understanding of the cumulative effects of the proposed action. 6

Stream Crossings/Inwater Work

Our review of the FEIS will consider the impacts of constructing stream crossing over anadromous and resident fish streams and their tributaries. The level of detail of information we review for stream crossings is typically not sufficient at the planned phase of unit card development to determine if proposed in-stream activities are consistent with applicable ACMP standards (6 AAC 80.130(a)(7), (b) and (c)(7)). 7

In the event that certain proposed in-stream activities will not conform to these standards, they must be allowed if there is significant public need, no feasible prudent alternative exists

to meet the public need, and all feasible prudent steps will be taken to maximize conformance with the applicable standards (6 AAC 80.130 (d)).

The preferred alternative for the Sale identifies construction of two fords across Frosty Creek as an option to access units across the stream. While timing of construction and use are proposed in the DEIS, we feel this alternative is not "consistent to the maximum extent practicable" with the ACMP because of impacts to water quality which would result. We request this proposal be eliminated from the FEIS. } 8

We request that information regarding types of structures to be used, construction techniques, expected timing for inwater work, a report of habitat conditions by a fisheries biologist, and any proposed mitigation measures be provided to DFG a minimum of 30 days prior to the date work is scheduled to begin. } 9

Water Quality/Aquatic Habitat

The following comments are suggested improvements to the water quality and aquatic habitat discussions in the Frosty Bay DEIS.

1. Table 4-5 identifies 5.7 miles of streams protected by Class 1, 2, and 3 Alaska Habitat Management Unit (AHMU) prescriptions for the preferred alternative. Table 4-10 lists only 1.7 miles of sensitive streambank with AHMU prescriptions for the preferred alternatives. Explain and clarify the differences between these figures. } 10
2. Alternative 3 (the preferred alternative) will allow harvesting and/or road building on 102 acres that are identified as high hazard soils. Identify which specific harvest and road units contain high hazard soils and the potential impacts to the particular watershed(s). Explain why harvesting is scheduled for areas of high hazard soils and discuss possible ameliorative measures. Identify, as unit cards are developed, potential impacts to aquatic habitat and water quality which may occur as a result of mass wasting. } 11
3. Identify sensitive areas (e.g. sensitive habitats, steep slopes, etc.) along the proposed route placement of roads. Discuss disturbance of these areas in terms of potential water quality and aquatic habitat impacts. } 12
4. Define other best management practices (BMPs) to be followed for road construction and cutting activities adjacent to streams, waterbodies and wetlands which are not found in the AHMH. Identify and discuss BMPs according to site-specific environmental criteria. } 13

5. Due to their interrelated nature, combine or immediately sequence the watershed and fisheries discussions in Chapter 4, "Environmental Consequences." } 14
6. Identify cumulative impacts to the aquatic habitat and water quality as required by the AHMH. } 15
7. Develop a water quality monitoring plan as required by the AHMH. } 16
8. Identify the upland borrow source(s) of road fill and associated impacts to water quality and aquatic habitat. } 17

OTHER ISSUES OF STATE CONCERN

Retention

The complete process for identification of retention includes identification of Wildlife Habitat Management Units (WHMU's), and Fish Habitat Management Units (FHMU's), completion of a Management Area Analysis and finally designation of retention areas at the project planning level. } 18

In the Frosty Bay DEIS, on page 2-5, the "harvest scenario" for the preferred alternative "assumes second entry in 30 years to take one-third remaining volume, third entry in 60 years to take second one-third, fourth entry in 90 years to take final one-third." There appears to be no long range plan to provide retention for the needs of old-growth dependent species in the Frosty Timber Sale area. } 19

Additionally, the arrangement of units in the planning area restricts the ability of the Forest Service to provide for the needs of species such as owls and goshawks which require large tracts of old-growth habitat. This spacial configuration could lead to localized extinction of some species without consideration for this impact. } 20

Pursuant to the Fish and Wildlife Coordination Act, we request unit 10A and a portion of unit 9 described later be deleted from the final preferred alternative, and a joint interagency planning effort to identify retention be completed prior to completion of the FEIS. This process should include representatives of the U.S. Fish and Wildlife Service to address the Vancouver Canada goose issue. Some unit changes may be needed after needed retention areas are designated. } 21

February 14, 1990

Monitoring

No specific monitoring of effects of the proposed activity is identified in the DEIS. However, unspecified short term monitoring is proposed under the mitigation section to evaluate impacts to Vancouver Canada geese. The State believes this would be better represented in the monitoring section with inclusion of more detail regarding what will be done. The State believes it is also important that the Forest Service make a long-term commitment to this effort as expected impacts may be greatest when the second growth forest canopy closes over.

22

23

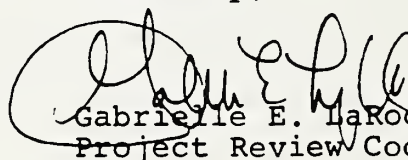
Subsistence

The State believes that the subsistence sections should reference the Tongass Resource Use Cooperative Survey Reports on the communities of Thorne Bay, Coffman Cove, and Meyers Chuck. In addition, information provided by the referenced Wrangell Harvest Study (Cohen, 1989) is not included in the document. It is important to review subsistence maps for these communities to evaluate the degree of overlap between subsistence use areas and proposed harvest units. This information is needed to comply with the mandated ANILCA 810 evaluation. Rob Bosworth of the Subsistence Division of DFG (465-2629) is available to assist the Forest Service in this analysis. This analysis also needs to consider the subsistence use of Vancouver Canada geese which nest in the sale area, but overwinter and are harvested for subsistence purposes, in other parts of Southeast Alaska.

24

In summary, thank you for the opportunity to comment on the draft. We are prepared to assist the USFS in identification of retention areas and to provide any other resource information needed. The State of Alaska looks forward to an FEIS and ROD which are responsive to the specific concerns raised by this letter. The State is also available to review subsequent federal consistency determinations for phased decision making following the FEIS and ROD, as the harvest units and road locations are laid out.

Sincerely,


Gabrielle E. LaRoche
Project Review Coordinator

cc: Valerie DeLaune, DNR, Juneau
Ron Schonenbach, DNR, Juneau
Nan Musslewhite, DNR, Juneau
Bob Palmer, DNR, Juneau
Bob Dick, DNR/DOF, Anchorage
Jim McAllister, DNR/DOF, Juneau
Mike Peacock, DNR/DOF, Juneau
Bill Hanson, DNR/DOF, Ketchikan
Judith Bittner, DNR, Anchorage
Rick Reed, DFG, Juneau
Don Cornelius, DFG, Petersburg
Bill Janes, DEC, Juneau
Diane Mayer, DCED, Juneau
Tom Sheehy, USFS NEPA Coordinator, Juneau
Pete Tennis, USFS, Petersburg Ranger District
Carrie Sykes (w/PIS), DGC, Juneau

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STATE OF ALASKA
DIVISION OF GOVERNMENTAL COORDINATION
STANDARDS OF THE
ALASKA COASTAL MANAGEMENT PROGRAM

Standard(s): 6 AAC 80.100. TIMBER HARVEST AND PROCESSING.
Notwithstanding any other provision of this chapter, the statutes pertaining to and the regulations and procedures of the Alaska Forest Resources and Practices Regulations with respect to the harvest and processing of timber are incorporated into the Alaska coastal management program and constitute the components of the coastal management program with respect to those purposes.

Authority: AS 41.17.010
AS 44.19.893
AS 46.40.040

STATE OF ALASKA
DIVISION OF GOVERNMENTAL COORDINATION
STANDARDS OF THE
ALASKA COASTAL MANAGEMENT PROGRAM

Standard(s): 6 AAC 80.130. HABITATS. (a) Habitats in the coastal area which are subject to the Alaska coastal management program include:

- (1) offshore areas;
- (2) estuaries;
- (3) wetlands and tideflats;
- (4) rocky islands and seacliffs;
- (5) barrier islands and lagoons;
- (6) exposed high energy coasts;
- (7) rivers, streams, and lakes; and
- (8) important upland habitat.

(b) The habitats contained in (a) of this section must be managed so as to maintain or enhance the biological, physical, and chemical characteristics of the habitat which contribute to its capacity to support living resources.

(c) In addition to the standard contained in (b) of this section, the following standards apply to the management of the following habitats:

(1) offshore areas must be managed as a fisheries conservation zone so as to maintain or enhance the state's sport, commercial, and subsistence fishery;

(2) estuaries must be managed so as to assure adequate water flow, natural circulation patterns, nutrients, and oxygen levels, and avoid the discharge of toxic wastes, silt, and destruction of productive habitat;

(3) wetlands and tideflats must be managed so as to assure adequate water flow, nutrients, and oxygen levels and avoid adverse effects on natural drainage patterns, the destruction of important habitat, and the discharge of toxic substances;

STATE OF ALASKA
DIVISION OF GOVERNMENTAL COORDINATION
STANDARDS OF THE
ALASKA COASTAL MANAGEMENT PROGRAM

Standard(s): 6 AAC 80.140. AIR, LAND, AND WATER QUALITY.
Notwithstanding any other provision of this chapter, the statutes pertaining to and the regulations and procedures of the Alaska Department of Environmental Conservation with respect to the protection of air, land, and water quality are incorporated into the Alaska coastal management program and, as administered by that agency, constitute the components of the coastal management program with respect to those purposes.

Authority: AS 44.19.893
AS 46.40.040

STATE OF ALASKA
DIVISION OF GOVERNMENTAL COORDINATION
STANDARDS OF THE
ALASKA COASTAL MANAGEMENT PROGRAM

Standard(s): 6 AAC 80.060. RECREATION. (a) Districts shall designate areas for recreational use. Criteria for designation of areas of recreational use are

(1) the area receives significant use by persons engaging in recreational pursuits or is a major tourist destination; or

(2) the area has potential for high quality recreational use because of physical, biological, or cultural features.

(b) Districts and state agencies shall give high priority to maintaining and, where appropriate, increasing public access to coastal water.

Authority: AS 44.19.893
AS 46.40.040

Letter From Gabrielle E. LaRoche, Alaska Division of Governmental Coordination

Comment 1:
(paraphrased)

The document lacks site specific information and it would be helpful if unit cards would be included.

Response 1:

Information from the unit and road cards has been summarized for the preferred alternative in the Final EIS as unit and road descriptions.

Comment 2:
(paraphrased)

However, where issues remain unresolved, we request that the process recently developed for State participation in phased decisionmaking be followed.where agreement cannot be reached regarding ACMP consistency, the State will jointly participate in field reviews.....and if disagreement still exists regarding consistency, the State will consider other remedies.

Response 2:

You are referring to the process developed for the long term sale analysis on the Ketchikan Area. What process or agreements are established for other projects or Areas on the Tongass will be followed once an agreement has been reached.

Comment 3:

Additionally, the State requests that the process for post-layout review be applied to activities which require additional State agreement, such as planned activities in fish streams.

Response 3:

The Forest Service will work with the State on this issue.

Comment 4:
(paraphrased)

Units 9, 10, 11, 12 and 13 may not be consistent with ACMP because of impacts to goose nesting habitat. It may require the increase in the width of buffer strips.

Response 4:

See responses 4, 7, and 9 to letter from Don Cornelius, ADFG.

Comment 5:

We understand that a goose model has been developed and we are available to assist the Forest Service in applying this model to determine appropriate buffers.

Response 5:

See response 8 to letter from Don Cornelius, ADFG.

- Comment 6:**
(paraphrased) Concerned about the omission of land otter in the list of Management Indicator Species (MIS) in the environmental effects section. The narrative needs to be expanded to provide a more thorough understanding of the cumulative effects.
- Response 6:** See responses 2 and 12 to letter from Don Cornelius, ADFG.
-
- Comment 7:**
(paraphrased) Level of information provided for the proposed stream crossing is not sufficient to determine if the crossings are consistent with applicable ACMP standards.
- Response 7:** The Forest Service will work with the State on this issue.
-
- Comment 8:**
(paraphrased) Request that the two fords proposed for construction across Frosty Creek be dropped because of the impacts to water quality and will not be consistent with ACMP.
- Response 8:** The option of using a ford has been dropped from consideration.
-
- Comment 9:**
(paraphrased) Request that information on types of structures, construction techniques, habitat conditions and timing of construction be supplied to fisheries biologists a minimum of 30 days prior to time work is done.
- Response 9:** The Forest Service will supply the information in accordance to the agreements we are currently working under. Our concern is that the proper individuals and agencies are contacted in a timely manner. This we will do.
-
- Comment 10:** Table 4-5 identifies 5.7 miles of streams protected by Class 1, 2, and 3 Aquatic Habitat Management Unit (AHMU) prescriptions for the preferred alternative. Table 4-10 lists only 1.7 miles of sensitive streambank with AHMU prescriptions for the preferred alternatives. Explain and clarify the differences between these figures.
- Response 10:** Table 4-6 (4-5 in the Draft EIS) shows the total miles of stream with harvest and/or road construction within 100 feet of the streambanks. Table 4-1 (4-10 in the Draft EIS) shows those parts of the same streams which have sensitive banks. The difference (i.e. 4.0 miles) shows streambanks, based on channel type, that are not as sensitive to management activities. AHMU prescriptions will be applied based on actual streambank conditions and fish and wildlife habitat needs observed during unit and road layout.
-
- Comment 11:** Alternative 3 (the preferred alternative) will allow harvesting and/or road building on 102 acres that are identified as high hazard soils. Identify which specific harvest and road units contain high hazard soils and the potential impacts to the particular watershed(s). Explain why harvesting is scheduled for areas of high hazard soils and discuss possible ameliorative measures. Identify, as unit cards are developed, potential impacts to aquatic habitat and water quality which may occur as a result of mass wasting.

- Response 11:** Most of the areas which have high hazard soils were eliminated from the units. A field review conducted this spring has shown that some soil hazards were not as great as the inventories indicated, especially in Unit 9 and 17. These areas are now scheduled for harvest.
-
- Comment 12:** Identify sensitive areas (e.g. sensitive habitats, steep slopes, etc) along the proposed route placement of roads. Discuss disturbance of these areas in terms of potential water quality and aquatic habitat impacts.
- Response 12:** Unit and road descriptions have been included in this Final EIS. The areas where special measures may be required have been delineated and mitigative measures have been proposed (i.e. end haul of excavated material has been proposed, etc.).
-
- Comment 13:** Define other best management practices (BMPs) to be followed for road construction and cutting activities adjacent to streams, waterbodies and wetlands which are not found in the AHMU. Identify and discuss BMPs according to site-specific environmental criteria.
- Response 13:** Management practices have been described in site-specific detail in the Unit and Road Descriptions in Appendices E and F. The following BMPs relate specifically to road construction and cutting activities and can be found in Forest Service Handbook 2509.22:
- 12.6 riparian areas
 - 13.9 yarding suspension
 - 13.15 #10, channel protection
-
- Comment 14:** Due to their interrelated nature, combine or immediately sequence the watershed and fisheries discussions in Chapter 4, "Environmental Consequences."
- Response 14:** The Final EIS has been changed to do so.
-
- Comment 15:** Identify cumulative impacts to the aquatic habitat and water quality as required by the AHMU.
- Response 15:** Cumulative effects have been identified in the Draft EIS as "no measurable effect anticipated and no habitat-related reduction in the fish population." Under the scenarios proposed, we anticipate minimal cumulative watershed effects due to the minimum of a 30 year recovery time between harvests. A scenario is just the planning assumption used. Whether or not the harvest sequence will occur as planned is not known. If the real situation is different then the scenario, then the impacts will have to be analyzed again at that time.
-
- Comment 16:** Develop a water quality monitoring plan as required by the AHMU.

- Response 16:** Water Quality Monitoring Plans are part of the Implementation effectiveness monitoring part of TLMP. Not all areas will be monitored; only representative areas with similar physical characteristics. It has not been determined whether or not the Frosty area will be a monitoring point.
-
- Comment 17:** Identify the upland borrow source(s) of road fill and associated impacts to water quality and aquatic habitat.
- Response 17:** Proposed rock source sites have been shown on a new map which has been put in this Final EIS (see "Road Description" map in Appendix F). Each rock source still needs to be "proven" in the field. A plan will be prepared prior to the development of each site and the plan will take into account resource concerns. It is anticipated that protection standards will be met on each pit.
-
- Comment 18:**
(paraphrased) Concerned about the process for identification of retention including WHMU's and FHMU's.
- Response 18:** See Response 2 to letter from Don Cornelius, ADFG.
-
- Comment 19:** There appears to be no long range plan to provide retention for the needs of old-growth dependent species in the Frosty Timber Sale area.
- Response 19:** See Response 2 to letter from Don Cornelius, ADFG.
-
- Comment 20:** Additionally, the arrangement of units in the planning area restricts the ability of the Forest Service to provide for the needs of species such as owls and goshawks which require large tracts of old-growth habitat. This spacial configuration could lead to localized extinction of some species without consideration for this impact.
- Response 20:** See Response 5 to letter from Don Cornelius, ADFG.
-
- Comment 21:** Pursuant to the Fish and Wildlife Coordination Act, we request unit 10A and a portion of unit 9 described later be deleted from the final preferred alternative, and a joint interagency planning effort to identify retention be completed prior to completion of the FEIS. This process should include representatives of the U.S. Fish and Wildlife Service to address the Vancouver Canada goose issue. Some unit changes may be needed after needed retention areas are designated.
- Response 21:** See Responses 2 and 4 to letter from Don Cornelius, ADFG.
-
- Comment 22:** No specific monitoring of effects of the proposed activity is identified in the Draft EIS. However, unspecified short term monitoring is proposed under the mitigation section to evaluate impacts to Vancouver Canada geese. The State believes this would be better represented in the monitoring section with inclusion of more detail regarding what will be done.

Response 22: See Responses 2 and 15 to letter from Don Cornelius, ADFG.

Comment 23: The State believes it is also important that the Forest Service make a long-term commitment to this effort as expected impacts may be greatest when the second growth forest canopy closes over.

Response 23: See Response 15 to letter from Don Cornelius, ADFG.

Comment 24: The State would like more subsistence information and should have more data included in the document. Subsistence analysis also needs to consider the subsistence use of Vancouver Canada geese.
(paraphrased)

Response 24: See Response 16 to letter from Don Cornelius, ADFG. There is no recognized subsistence use of Vancouver Canada geese in southeast Alaska.

MEMORANDUM

State of Alaska

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF PARKS AND OUTDOOR RECREATION

Gabrielle LaRoche

February 14, 1990

TO: Division of Governmental Coordination
Juneau

DATE:

FILE NO.:

3130-1R (USFS)

762-2626

THRU:

TELEPHONE NO.:

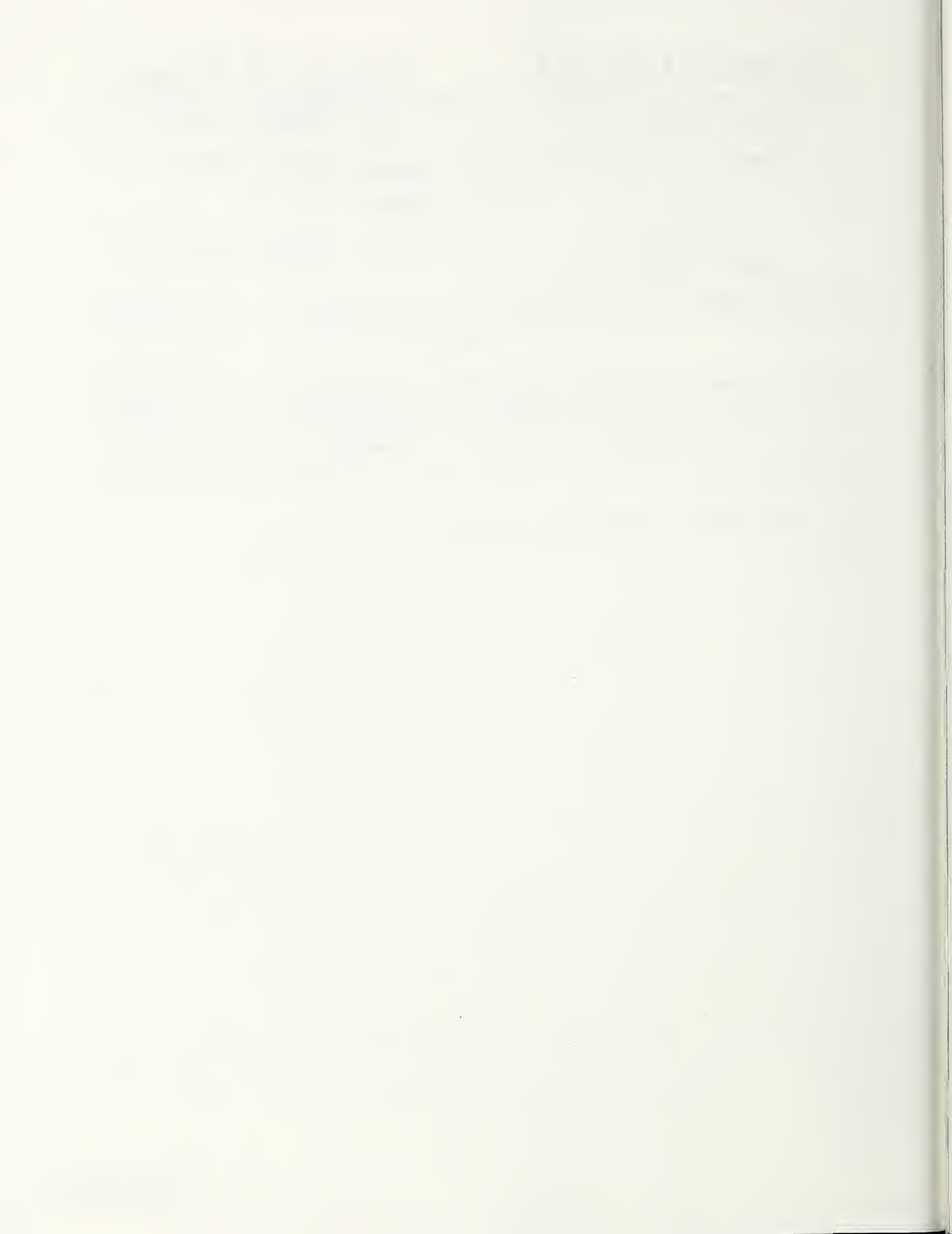
SUBJECT: Frosty Bay Draft EIS
AK891227-10/J

FROM: Judith E. Bittner
State Historic Preservation Officer

We have reviewed the referenced project for conflicts with cultural resources per 36 CFR 800. We believe the proposed project will not impact any resources listed on, or eligible for listing on, the National Register of Historic Places. This assessment is based on an examination of our records of currently known resources and knowledge about past settlement and subsistence patterns of the area.

cc: Mark McCallum, Stikine Area Archaeologist

JD:clk





United States Department of the Interior

OFFICE OF THE SECRETARY

Office of Environmental Affairs
1689 C Street, Room 119
Anchorage, Alaska 99501-5126



Wrangell Ranger District	
FEB 21 1990	
Mr. Richard K. Kohrt	
District Ranger	
P.O. Box 51	
Wrangell, Alaska 99929	

ER90/13

February 15, 1990

Mr. Richard K. Kohrt
District Ranger
P.O. Box 51
Wrangell, Alaska 99929

Dear Mr. Kohrt:

In response to your December 13, 1989, request we have reviewed the Frosty Bay Timber Sale Draft Environmental Impact Statement. We offer the following comments for your consideration.

General Comments

The Draft Environmental Impact Statement (DEIS) does not describe potential impacts to wetlands habitat by timber harvesting, road building and related activities. It also fails to acknowledge Federal responsibilities for protection of wetlands and floodplains under Executive Orders 11988 and 11990. In order to satisfy the Executive Orders, agencies are to avoid undertaking or providing assistance for new construction located in wetlands unless (1) there is no practical alternative and (2) the proposed action includes all practicable measures to minimize any resulting harm. In addition, each agency is to provide for early public review of plans or proposals for new construction within wetlands or floodplains. The DEIS should be expanded to address the wetlands and floodplains that will be affected by the proposals (if any) and describes steps to be taken to avoid impacts. The statement should also provide guidance for field identification, protection and possible restoration of wetlands.

The DEIS should be expanded to address the mitigation of impacts to wildlife resources. We believe the statement should describe what actions will be taken to satisfy the following mitigation objectives: (a) avoid the impact altogether, (b) minimizing impact by limiting the degree or magnitude of the action and its implementation; (c) rectify the impact by repairing, rehabilitating, or restoring the affected environment; (d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and (e) compensate for the impact by replacing or providing substitute resources or environments.

The DEIS does not identify retention acres as specified in the Tongass Land Management Plan (TLMP). In contrast, all alternatives in the DEIS describe multiple entries that would remove all remaining economic timber volume within 50 to 90 years. We recommend that the Forest Service identify and delineate important fish and wildlife habitats suitable for retention in cooperation with interested resource agencies, and that they maintain a complete inventory of all habitats managed under the retention prescription.

3

Specific Comments

Page S-3, Mitigation of Consequences: Neither item (e) 2, studies to evaluate impacts, nor (f) buffers around eagle nest trees, meet the mitigation objectives discussed above. The former is better categorized as monitoring while the latter is considered to be the minimum necessary to avoid violation of the Bald Eagle Protection Act (16 U.S.C. 668-668d). We recommend the statement incorporate wildlife mitigation conforming to the objectives addressed above under general comments.

4

Page 1-4, Approvals from Other Agencies: It should be noted that all fill activities in waters of the United States are regulated by the Clean Water Act as amended (33 USC 1251 et seq). Silvicultural activities are authorized in accordance with the requirements of Section 404(f) of the Act and 33 CFR 323.4(a) of Corps of Engineers' regulations. The latter specifies best management practices to be implemented to avoid further regulation. The statement should identify the steps taken to insure all proposals will conform with those best management practices.

5

Page 2-1, Introduction: The section on "Guidelines Followed in Developing the Alternatives" does not discuss the Tongass Land Management Plan or the Alaska Regional Guide. We recommend that the statement reference conform with these two important guidances.

6

Page 2-6, Helicopter Option: By listing the "helicopter option" separately, the DEIS gives the impression that this is a separate alternative with separate environmental consequences. Since helicopter harvesting is very probable under today's improved market conditions (one such sale is currently underway across Seward Passage from Frosty Bay), the "helicopter option" should be considered integral to each action alternative. We recommend the alternative analysis include the combined impacts of both roaded and helicopter harvesting proposals for each alternative.

7

Page 3-3, Vancouver Canada Goose: As noted here, the Frosty Bay study area is one of only a few sites on the Tongass National Forest where high-density nesting habitat for these geese is known to occur. This habitat merits special management attention. We recommend these areas be given Wildlife Habitat Management Unit (WHMU) status and be managed accordingly.

8

Page 4-4, Goose Habitat: The DEIS states that Vancouver Canada Goose habitat requirements are not well understood and therefore an analysis of impacts to goose habitat and populations is not available. An inter-agency team has developed a draft Vancouver Canada Goose model similar to the models for other

9

management indicator species in conjunction with the Forest Service's revision of the Tongass Land Management Plan. Since the goose is one of five management indicator species chosen for analysis in this statement, the model should be used to estimate impacts to goose habitat and populations as is done with the other management species.

9

Page 4-9, Vancouver Canada Goose: According to current knowledge of Vancouver Canada goose behavior and habitat use (as demonstrated in the draft habitat capability model), young clearcuts are expected to have no habitat value for nesting or brood rearing of Vancouver Canada geese. Therefore, we consider the statement that "... juvenile geese will probably use young clearcuts for foraging" to be inaccurate. The DEIS should express the inter-agency consensus opinion that young clearcuts will not be used by juvenile geese.

10

The statement that Aquatic Habitat Management Handbook (AHMU) guidelines "would protect most of the existing goose habitat by providing buffers along streambanks" is misleading. Comparison of the goose habitat (Map 1-2) and the barrier falls (Map 3-3) shows that the delineated Frosty Creek high-use goose nesting habitat occurs above barrier falls, and thus is included in Class 2 or possibly Class 3 AHMU's. Guidelines for buffers allow selective harvest of up to 60 percent of trees in Class 2 AHMU's and up to 90 percent of trees in Class 3 AHMU's. Computations from information in Table 4-5 show that within the sale area 84 - 88% of the affected stream miles (1005 for helicopter option) would occur in Class 2 or 3 AHMU's. Since Vancouver Canada geese depend heavily on the understory vegetation for food and cover, severe disturbances of this vegetation associated with the potential level of timber harvesting within the buffers can be expected to significantly reduce habitat values for the geese.

11

Page 4-10, Bald Eagles: Out of five bald eagle nests displayed in the DEIS for the sale area, three occur in proposed timber harvest units, apparently in all action alternatives. Up to 24 percent of the beach fringe and eagle nesting habitat may be cut in the sale area. The number of nest trees within proposed units is excessive. Even with 330-foot buffer zones around the nest trees potential loss of the nest trees is greater due to increased risk of blow-down especially through "unraveling" of the buffer by windthrow. We recommend that the harvest units be placed so as to provide more long-term protection of the eagle nesting and perching habitat within the beach fringe.

12

Page 4-10, AHMU's: The 100-foot width of the AHMU buffers should be considered the minimum width necessary to be maintained on each side of streams. The AHMU concept should also apply to all adjacent wetland and floodplain areas associated with the stream hydrology, no matter the distance, since these areas functionally comprise the riparian zone. Such inclusion and strengthened management guidelines would also facilitate conformance with Executive Orders 11988 and 11990. We support the 1988 National Marine Service, Alaskan Regional Policy, that the minimum buffer zone of 30 meters (100 feet) be maintained on each side of the stream, and should consist of natural/existing undisturbed forest.

13

Also, the protection afforded AHMU's should not rely solely on the presence or absence of anadromous and resident fish species. As shown in the previous discussion of geese, other habitat values may merit increased protection within an AHMU, making the present AHMU guidelines inadequate to protect those resources.

14

Page 4-18, Watershed: The discussion on protection of sensitive stream channels in relation to AHMU status along with Table 4-10, Length of Sensitive Streambank with AHMU Prescriptions, infer that the AHMU status confirms an equal and adequate level of protection for these streams while remaining mute as to the channel's classification. The streams classification and thus the level of protection is based on the presence or absence of anadromous and resident fish irregardless of streambank sensitivity. Comparison of Map 4-2, Location of Sensitive Streambanks in Relation to Harvest Units, with Map 3-3, Barrier Falls in Frosty Creek, shows that most of the designated sensitive streambanks occur in channels above barriers to anadromous fish, thus Class 2 or 3 AHMU's guidelines apply. These guidelines allow harvesting of 60 to 90 percent of the trees within the AHMU. We recommend sensitive streambanks be given management protection based on their sensitivity, not just the current AHMU classification.


15

Page 4-24, Monitoring: This section lacks specificity as to what actions will be taken, what effects will be studied, how and when effects will be measured, and how this information will be studied, how and when effects will be measured, and how this information will be recorded and reported. We recommend that the statement specify those actions.

16

Thank you for the opportunity to provide these comments.

Sincerely,



Paul D. Gates
Regional Environmental
Officer - Alaska

Letter From Paul D. Gates, U.S. Department of the Interior

Comment 1:
(paraphrased)

The Draft EIS does not describe potential impacts to wetlands habitat and fails to acknowledge Federal responsibilities under Executive Orders 11988 and 11990. The DEIS should be expanded to address the wetlands and floodplains that will be affected by the proposal and describe steps to be taken to avoid impacts and to provide for the protection/restoration of wetlands.

Response 1:

You're right; we didn't. We have done so in the Final EIS by including maps and figures, and by displaying consequences on wetlands and floodplains.

Comment 2:

The Draft EIS should be expanded to address the mitigation of impacts to wildlife resources. We believe the statement should describe what actions will be taken to satisfy the following mitigation objectives: (a) avoid the impact altogether, (b) minimize impact by limiting the degree or magnitude of the action and its implementation; (c) rectify the impact by repairing, rehabilitating, or restoring the affected environment; (d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and (e) compensate for the impact by replacing or providing substitute resources or environments.

Response 2:

No development can be done without some impact and this area, as a result of TLMP, was allocated for development. We believe the mitigation measures proposed in the Final EIS will maintain the long term productivity of the area for all resources, including wildlife.

Also see Response 2, Mitigation, ADFG letter.

Comment 3:
(paraphrased)

The Draft EIS does not identify retention acres as specified in the Tongass Land Management Plan (TLMP). Recommends that Forest Service identify and delineate retention areas with other resource agencies and complete inventory of retention areas be maintained by the other agencies.

Response 3:

We agree. See Response 2, ADFG letter. Retention is now included in Chapters 3 and 4 according to the current Forest Plan, and in Appendix I according to the Draft preferred alternative of the Forest Plan Revision.

Comment 4:

Page S-3, Mitigation of Consequences: Neither item (e) 2, studies to evaluate impacts, nor (f) buffers around eagle nest trees, meet the mitigation objectives discussed above. The former is better categorized as monitoring while the latter is considered to be the minimum necessary to avoid violation of the Bald Eagle Protection Act (16 U.S.C. 668-668d). We recommend the statement incorporate wildlife mitigation conforming to the objectives addressed above under general comments.

Response 4:

See Response 2 of ADFG letter.

- Comment 5:**
(paraphrased) The Final EIS should identify the steps taken to insure all proposals will conform with those best management practices that are required by the Clean Water Act as amended (33 USC 1251 et seq) and Section 404(f) of the Act and 33 CFR 323.4(a) of Corps of Engineers' regulations.
- Response 5:** See Response 13 to ADGC letter.
-
- Comment 6:** Page 2-1, Introduction: The section on "Guidelines Followed in Developing the Alternatives" does not discuss the *Tongass Land Management Plan* or the *Alaska Regional Guide*. We recommend that the statement reference conform with these two important guidances.
- Response 6:** Good point. The Final EIS describes the process of developing the alternatives in terms of Forest and Regional guidance documents.
-
- Comment 7:**
(paraphrased) The Draft EIS gives the impression that the helicopter option is a separate alternative with separate environmental consequences. The helicopter option should be considered integral to each action alternative and impacts should be combined with each alternative.
- Response 7:** Good point. It is true that many of the tables in the Draft EIS distinguished between high-lead and helicopter logging systems. Helicopter logging was presented as an option so the InterDisciplinary Team (IDT) had the option to include or exclude helicopter units. Even so, the discussion of cumulative effects in the Draft EIS was intended to include the helicopter acreage in each of the action alternatives. In the Final EIS, some high-lead units have been converted to helicopter units, some helicopter units have been deleted, and the helicopter units have been more fully integrated into the alternatives rather than presented as an option.
-
- Comment 8:**
(paraphrased) The high-density goose nesting habitat should be designated as Wildlife Habitat Management Unit (WHMU) status and merits special management attention.
- Response 8:** Good point. See Response 9, ADFG letter.
-
- Comment 9:**
(paraphrased) An inter-agency team has developed a draft Vancouver Canada goose model and it should be used to estimate impacts to goose habitat and populations.
- Response 9:** See Response 8, ADFG letter.
-
- Comment 10:**
(paraphrased) According to current knowledge, young clearcuts are not expected to have any habitat value for nesting or brood rearing of Vancouver Canada geese. Consider the statement "...juvenile geese will probably use young clearcuts for foraging" to be inaccurate.

Response 10: The statement that geese would probably use clearcuts for foraging was based on information in the unpublished progress report, *Heceta Island Vancouver Canada Goose Nest Survey, 1977*, by Paul Harrington, Ketchikan Area of the Tongass National Forest. In this paper Harrington reports seeing goose use of clearcuts. Although it is suspected that use in clearcuts will be different from the original old growth stand, there is no information which contradicts this statement. This is one more reason for monitoring the impact of timber harvest on geese in the Frosty Study Area.

**Comment 11:
(paraphrased)** Above the barrier falls, streamside habitat would have only AHMU Class 2 or Class 3 protection. Because of the this reduction from Class I protection, more timber harvest will occur and there will be more impact on goose habitat.

Response 11: Preliminary results on the goose study this spring (1990) indicate that most goose nesting is very close to main Frosty Creek. Very little habitat or goose sign, and few geese were found on the minor tributaries.

The AHMU Handbook includes provisions for wildlife, although the primary emphasis is on fish. In most areas with goose nesting habitat there is a 100 foot buffer. In addition, extensive areas have been dropped in developing the preferred alternative to protect goose nesting and rearing habitat.

It is estimated that the preferred alternative would harvest 15 percent of known high-use goose habitat in the Frosty Creek drainage. The current Forest Plan direction for this area allows the harvest of up to 75 percent of this habitat. We estimate that the level of harvest proposed would not have a significant adverse impact on the geese in this area.

Also see Response 11, ADFG letter.

**Comment 12:
(paraphrased)** Out of five eagle nests within the sale area, three occur in proposed harvest units. Up to 24 percent of the beach fringe and eagle nesting habitat may be cut in the sale area. Even with 330-foot buffer zones around nest trees, windthrow loss is increased. More protection should be given eagle nesting and perching habitat within the beach fringe.

Response 12: The three eagle nests referred to have more than 330 foot buffers in all alternatives. The road providing access to Units 1 and 2 was re-routed to avoid one of these nests. This also resulted in a reduction in the amount of beach fringe lost to road construction. In the preferred alternative, only 3 percent of the beach fringe in the study area is scheduled for harvest. We estimate that this will not have a significant impact on bald eagles.

Comment 13:
(paraphrased)

The 100-foot AHMU buffers should be considered the minimum width necessary. The concept of buffers should apply to all adjacent wetland and floodplain areas and would insure the conformance with Executive Orders 11988 and 11990. The Department of the Interior supports the National Marine Service in proposing that the minimum buffer zone of 30 meters (100 feet) be maintained on each side of the stream, and should consist of natural/existing undisturbed forest.

Response 13:

Approximately 63% of the Frosty Study Area is classified as wetland/floodplain. The same is true for most of the temperate rain forest of southeast Alaska. Much of this 40% is comprised of muskeg, which is not the rich habitat one might picture when speaking of a wetland or a floodplain area. To buffer all wetlands in southeast Alaska, regardless of productivity, would be extremely costly and rarely serve a useful purpose. Many riparian areas are already protected by Aquatic Habitat Management Unit (AHMU) buffers and retention designation, and there is no point in building a buffer around an AHMU. Protective management units have been established to protect inherent resource values.

Comment 14:

Also, the protection afforded AHMUs should not rely solely on the presence or absence of anadromous and resident fish species. As shown in the previous discussion of geese, other habitat values may merit increased protection within an AHMU, making the present AHMU guidelines inadequate to protect those resources.

Response 14:

Extensive riparian areas have already been set aside for protection of water quality, fisheries, and wildlife values (i.e. geese). Current Forest Plan direction does not mandate 100% protection of riparian areas. In fact, more acres of riparian habitat will remain after harvest of the preferred alternative than the minimums currently mandated by the Forest Plan.

Comment 15:
(paraphrased)

.....We recommend sensitive streambanks be given management protection based on their sensitivity, not just the current AHMU classification.

Response 15:

We agree. In some cases larger buffers have been proposed. In other cases, sensitive streambanks are protected by requiring split line yarding and full or partial suspension of logs. The AHMU guidelines also contribute significantly to streambank protection. Additional mitigation may be proposed on a site-specific basis as the need becomes apparent.

Comment 16:

Page 4-24, Monitoring: This section lacks specificity as to what actions will be taken, what effects will be studied, how and when effects will be measured, and how this information will be studied, how and when effects will be measured, and how this information will be recorded and reported. We recommend that the statement specify those actions.

Response 16:

We agree. The Final EIS will provide more specific information on monitoring.

Wrangell
Ranger District

FEB 26 '91

Info.		Act.
✓	Dist. Ranger	
	B.M.A.	
	T.M. Oper.	
	O.R.A.	
	F & W	
	Planning	
	Engineering	
	log Asst.	
	Resource Ctl	
	steven S	
	Cap to SO	

Harry E Wilson
3120 N Gallow Ave
Bremerton, WA 98312-2908
14 February 1991

Mr Richard W Kort
District Ranger
P.O. Box 51
Wrangell, AK 99929

Dear Sir

Thank you for the opportunity to comment on the Draft
Environmental Impact Statement for Frosty Bay Timber Sale
Tongass National Forest, Stikine Area.

I think that Alternative 3 with the helicopter option
should be the preferred alternative.

The Vancouver Canada Goose old growth habitat needs to
be studied further. all logging in its habitat should be
closely monitored.

The use of a helicopter should be encouraged to avoid
building more roads than are necessary.

Is their money in the Tongass National Forest budget to
purchase a portable bridge?

These questions may have been answered already but a
short statement needs to be placed in the Final
Environmental Impact Statement. Where is the floating log
camp going to get its water? Where is the camp going to
dispose of its wastes, both solid and sewage?

Thank you for your time and consideration.

Sincerely

Harry E Wilson

Harry E Wilson
3120 N Gallow Ave
Bremerton, WA 98312-2908

Letter From Harry E. Wilson

- Comment 1:** The Vancouver Canada goose old growth habitat needs to be studied further, all logging in its habitat should be closely monitored.
- Response 1:** We agree. The implementation of this project is viewed as an opportunity to learn more on this wildlife/habitat relationship. A study will be conducted in conjunction with the timber sale.
-
- Comment 2:** The use of a helicopter should be encouraged to avoid building more roads than are necessary.
- Response 2:** We agree. This system has given more options in the design of units. Favorable market conditions is the major factor in allowing helicopter logging to even be considered.
-
- Comment 3:** Is there money in the Tongass National Forest budget to purchase a portable bridge?
- Response 3:** Not now, but if needed, a budget request could be made and if it were given a high priority, a bridge could be purchased.
-
- Comment 4:** Where is the floating log camp going to get its water? Where is the camp going to dispose of its wastes, both solid and sewage?
- Response 4:** Every floating camp is designed differently. Some camps require on shore hook-ups for water and sewage and some are designed to be completely self-sufficient with holding tanks and rainwater catch systems. The needs will have to be assessed after it is known what will be used. Regardless of design, applicable state and federal laws will have to be followed.
-

Appendix H

Late Comments
on
Draft EIS

APPENDIX H

LATE COMMENTS ON DRAFT EIS

12-29-89: Draft EIS Published in Federal Register
02-27-90: Final Comment Date

This appendix includes letters received following the February 27th final comment date. Responses were not developed to these comments, however they are included here for reference. Where possible, suggestions from these letters were incorporated into the Final EIS.

<i>COMMENTING PERSON OR GROUP</i>	<i>DATE RECEIVED</i>	<i>PAGE NUMBER</i>
Chris Finch, Southeast Alaska Conservation Council	3-9-90	1
Ronald A. Lee, U.S. Environmental Protection Agency	3-13-90	11
Tom Paul, Juneau, Alaska	4-2-90	15
Steven Pennoyer, U.S. Department of Commerce, National Oceanic and Atmospheric Administration	4-4-90	17

Southeast Alaska Conservation Council

SEACC • P.O. Box 021692 • Juneau, Alaska 99802 • (907-586-6942)

MAR - 9 1990

March 5, 1990

Richard K. Kohrt
District Ranger
P.O. Box 51
Wrangell, AK 99929

176	Dist. Ranger	
	B.M.A.	
	T.M. Oper.	
	G.E.A.	
	F.S.W.	
	Planning	
	Engineering	
	Log Acct.	
	Resource Ctr.	

Dear Mr. Kohrt:

Thank you for the opportunity to comment on the Frosty Bay Draft Environmental Impact Statement (DEIS). The cover letter which accompanied the DEIS stated that it would be published in the Federal Register on December 22, 1989. However, I did not find any notice of the DEIS in the Federal Register on this date or for several days before and after this date. Please include the following comments in the official planning record.

The Frosty Bay watershed considered in the DEIS is part of one of the last large unlogged, roadless areas on the Cleveland Peninsula. It is also adjacent to the Anan watershed, a world-class wildlife and fisheries area which has been proposed by Congress for wilderness designation. Anan includes one of Southeast Alaska's best pink salmon rivers and has the highest black bear concentration in the state. Any plans for logging in Frosty Bay must consider impacts on adjacent areas, and particularly on Anan.

The Frosty Bay DEIS fails to provide a range of alternatives which takes these special characteristics into account. Furthermore, in the alternatives that are offered, the descriptions of the affected environment and of the impacts that would arise from proposed logging are much too general to accurately assess site-specific impacts. Alternatives which address the full range of resources and uses of Frosty Bay, provide comprehensive baseline data on these resources and uses, and detail the site-specific effects of each alternative must be incorporated into the Final EIS.

The Frosty Bay DEIS does not present an adequate range of alternatives.

The DEIS considers only alternatives 2, 3, and 4 in detail. For the most part, these three alternatives differ only in terms of volume of timber harvested. They do not, with minor exceptions, present significantly different scenarios with regard to impacts on wildlife, fisheries, subsistence and cultural resources. Nowhere in the DEIS is there a description, as required by the

Appendix H-1

National Environmental Policy Act (NEPA), of how the Forest Service actually came up with the alternatives. The range of options does not adequately address the concerns (including visual quality, fish habitat, and wildlife habitat) identified by the interdisciplinary team (IDT) nor is it nearly broad enough to address "public issues", as specified in the Stikine Area Guidelines. Instead, the alternatives all focus on timber harvest. Each alternative is simply a variation of the same general logging and roadbuilding plan, with slightly different impacts on wildlife, fish, recreation, and other resources. No explanation is provided of the rationale behind each specific alternative. The narrow range of alternatives dictates selection of a preferred alternative which emphasizes timber production rather than other resources. Until alternatives are provided which maximize wildlife, fisheries, subsistence, recreation, and other non-consumptive values, the EIS will not be complete.

The cumulative impact of timber operations at Frosty Bay is hidden by segmentation.

Because specific parts of the timber operation, including road logging, helicopter logging, and timber transfer and floating camp facilities, are treated as separate components in the EIS - process, the total impact of these activities is divided and so appears to be less than it actually is.

By treating the so-called "helicopter option" separately, the Forest Service masks the total timber harvest, and associated impacts, of each alternative. When the timber volume from the helicopter logging option is added to each alternative, the planned cut is increased by 43-71%, depending on the alternative. The helicopter logging option should be fully incorporated into each alternative, rather than being presented separately. Furthermore, the DEIS does not discuss the impacts of the proposed log transfer facility (LTF), sortyard, administrative cabin, and floating camp. Regardless of whether the LTF was discussed and approved in an earlier environmental assessment, a description of the facility and of the associated impacts on Frosty Bay, the proposed site for the log dump, must be included in the EIS in order for the full impact of a timber sale to be evaluated. While individual components of a timber program may not be major enough to require an EIS, the program must be evaluated as a whole, and all components included, in the EIS process.

The "No Action" alternative is not considered in the DEIS.

The draft EIS includes only a single paragraph on the effects of the "no action" alternative. Because no action is not considered, the DEIS fails to discuss the overall need for a timber sale at

Frosty Bay and fails to provide a basis for answering the initial question listed in Chapter 1 (see p.1, question a.): "Will timber harvest and road construction take place in the planning area at this time?" Rather than serving as a supposed "baseline", on paper only, the no-action alternative should be comprehensively analyzed in the EIS. What would be the costs and benefits if the status quo were maintained in the Frosty Bay area? How would no action affect the timber industry? How would it affect the public?

The preferred alternative appears to have been selected solely on the basis of maximizing timber harvest. Selection criteria must include non-timber resource values.

Other than justifying inclusion of the helicopter option (purely on the basis of economic feasibility for the timber industry), the DEIS does not explain how the Forest Service chose Alternative 3. The only justification for the selection is that it "provides the greatest volume of harvest with resource protection measures that are adequate under the management constraints for a LUD IV area." Why should the greatest volume of timber harvest be favored over a smaller volume less damaging to other resource values? Classification of an area as LUD IV means that logging is allowed to take place; it does not mean that logging is the preferred alternative or highest and best use of the area. In the absence of discussion of how the alternatives were formulated in the first place, and how a decision was arrived at, selection of the preferred alternative appears to have been based solely on timber maximization. If so, the selection process used in the Frosty Bay EIS fails to meet National Forest Management Act multiple use standards.

The DEIS fails to present adequate baseline data on resources and uses of the area.

The document presents little actual information on present wildlife and fisheries populations as well as on current uses of the area, including subsistence activities and recreation. Instead, comments are generally speculative and rarely supported with actual field evidence. Though they can play a role, habitat suitability models are no substitute for field research. Site-specific habitat maps and field information on wildlife species are necessary to make accurate assessments of logging impacts. However, such maps are provided only for deer. Without this information, and site-specific analyses of how individual logging units will affect wildlife populations, the relative impacts of the various alternatives cannot be judged with any certainty. NEPA requires the Forest Service to obtain and present this critical data, without which full disclosure of impacts is impossible.

The Forest Service presents only one site-specific habitat map on the five wildlife species analyzed, and no explanation of why these five species were the only ones included in the analysis. For Sitka black-tailed deer, the DEIS presents the numbers generated from a habitat suitability model, but no real explanation of how the numbers were generated.

By treating areas uniformly, models fail to provide the site-specific information needed to assess impacts. For deer, the DEIS (ch.3, p.1) makes a hopelessly unrealistic comparison between the number of deer an "optimum winter habitat" of this size could support and the number which the Frosty Bay area, according to the model, can support. (What is the definition of "optimum deer habitat"? How were the numbers for "optimum" habitat actually generated?) As the Forest Service well knows, the quality of wildlife habitat varies greatly over any area this large, and can be vastly different from one site to the next. Of course Frosty Bay does not have habitat values that compare to "optimum winter habitat." No area this large would be comprised solely of optimum habitat. By treating all of Frosty Bay as a single unit, the model ignores site-by-site variations in habitat and makes analysis of site-specific logging impacts impossible. Fortunately the DEIS does include a more site-specific map of deer winter range (ch.3, p.2). Though the map is never referred to in the text, it shows that much of the best winter range would be cut under each of the alternatives.

Data on the other wildlife species is similarly general. For example, the DEIS admits that population levels of pine marten are unknown, and instead extrapolates the area's carrying capacity based on state hunting and trapping records. This information is not sufficient to assess impacts of logging on local marten populations, and actual field data should be included in the final EIS.

The DEIS also fails to give a comprehensive assessment of the Vancouver Canada goose population, though the Forest Service states that one of only three high-density nesting sites for geese in the Wrangell Ranger District is found along Frosty Creek. Despite this unique attribute, no information on goose populations, or site-specific estimates of their temporal and spatial distribution are provided.

Discussions of black bear, bald eagle, and fisheries in the area are similarly sketchy and inconclusive. Particularly for black bear, the DEIS should take the proximity of Anan into account. This nearby area has the highest concentrations of black bear found in Alaska. Though the habitat in the Frosty Bay watershed may not be comparable to that found at Anan, this alone is a totally insufficient reason to conclude that "it is unlikely that large numbers of bears den in the Frosty area because there is abundant old growth present in areas of better habitat

nearby."(ch.3, p.3) Obviously, more information on black bear use of the area must be collected before logging impacts can be assessed. Site-specific maps of bear habitat should be included in the EIS.

Other species are not adequately addressed in the DEIS. For example, in the section on deer, the DEIS mentions that habitat values are low in part because of the presence of wolves. However, no analysis is made of wolf populations, or of the effect that the various alternatives would have on wolves. In a similar vein, the DEIS states that brown bears use the area only occasionally, but presents no supporting data. Other wildlife species, such as mink, moose, mountain goat, (all mentioned in the section on hunting and trapping) marbled murrelet, are completely absent from the discussion on affected environment. Habitat maps similar to the one provided for deer should be included for black and brown bear, pine marten, wolf, marten, moose, mountain goat, marbled murrelet, and other species found in the Frosty Bay area.

Descriptions of subsistence use, hunting and trapping, recreation, and cultural resources in the area are also insufficiently detailed and specific. Other than very general and often speculative comments on subsistence, hunting and trapping, and recreational use of the area, the DEIS includes no actual data on these uses. A comprehensive study of these uses is necessary before impacts of logging can be evaluated. Though the DEIS states that other cultural sites are likely to be present in the area, no effort appears to have been made to locate these sites. NEPA specifically provides that where important information on impacts is missing or incomplete, the Forest Service must gather that information.

In the three alternatives that are presented, potential impacts on non-timber resources and uses are incompletely assessed and, in some cases, wholly ignored. Furthermore, many of these impacts are not avoided in any of the proposed alternatives.

Wildlife habitat models do not account for site-specific differences in wildlife habitat and treat logging impacts as if they are distributed uniformly across the whole habitat area. Timber harvests are planned for specific sites, and the best wildlife habitat is found in specific places. A thorough analysis of logging impacts must take these site-specific variations into account, and present impacts on a site-by-site basis.

For example, the DEIS makes the general statement that only 8% of deer winter range in the Frosty Bay VCU would be harvested under the preferred alternative (ch.4, p.4). However, this analysis does not depict the differences in quality of this range, and the different associated effects of logging. The map of deer winter

range (ch.3, p.2) reveals one area of "excellent" deer winter range and larger areas of "good" and "fair" winter habitat. When compared to maps of logging units, this map reveals that each of the three proposed alternatives would log almost the entire area of "excellent" habitat, and that much of the logging and roadbuilding near Frosty Creek would take place in "good" deer habitat. None of the alternatives adequately protects this habitat. Though the habitat model predicts that 20% of the area's carrying capacity would be lost (ch.4, p.7), the DEIS does not adequately explain how this figure was calculated. The few assumptions listed are not sufficient to substantiate the model's predictions. Without actual field counts, models of habitat suitability and carrying capacity are not enough to accurately determine the impacts of logging.

The area along Frosty Creek is all slated as "high use" for geese (ch.3, p.4). However, extensive roadbuilding and logging activities are planned for this area in each of the three alternatives, although the Forest Service writes in the DEIS that "impacts of logging activities on nesting geese are not well known." The Forest Service goes on to make the outrageous statement that a timber sale in the area "would be an opportunity to evaluate the impact of logging and road building on nesting geese" (ch.4, p.9). The need for this information is doubtful at best, and without adequate baseline data, which appears not to have been collected, such study would have little value.

Discussions of impacts on marten and black bear are inconclusive. Impacts on pine marten are calculated based on a habitat model. However, a more detailed explanation of the model is needed. The model predicts that logging would not significantly reduce marten carrying capacity. However, it also assumes that winter range is the limiting factor on marten populations, and that marten prefer high-volume old growth for this range. According to Table 4-4 (ch.4, p.9), high-volume old growth would be reduced 29-35% by the alternatives under consideration; it seems unlikely that such a large reduction of critical winter habitat would only reduce marten population by 8-14%. The DEIS also does not adequately consider potential impacts to black bear. Though black bear winter habitat would be reduced by 29-35% under the proposed logging alternatives (helicopter option included), Forest Service biologists "anticipate that the remaining old growth would be adequate [to] meet black bear denning needs." Such conjecture must be supported with information or deleted from the EIS. Furthermore, biologists from Alaska Department of Fish and Game have not supported Erickson's findings that black bear will den in hollow logs in clearcuts. These discrepancies should be addressed in the EIS. Especially given Frosty Bay's proximity to the world-class black bear habitat at Anan, a much clearer understanding of impacts to black bears, documented with scientific research, must be included in the EIS.

Several other issues are of further concern. Except for the table on bears in Chapter 4 (p. 5), none of the tables on percentage of habitat harvested include the additional effects of the helicopter option. None of the environmental consequences listed for each species includes the effects of roads and logging camps and the resulting increases in hunting pressure. Key baseline data is also missing in the recreation use impacts analyses. The discussion of benefits of changes from primitive to "roaded recreation" in each VCU does not answer the greater question of what demand exists for such developed recreation uses or what the negative impacts on other types of recreational use will be. Further discussion of the impact of the helicopter option on recreation is also needed.

Location and impacts of the proposed log transfer facility, sortyard, and floating camp should be included in the EIS. How would the log dump and floating camp affect water quality, aesthetics, subsistence fishing opportunities, and recreation in Frosty Bay? These questions should be addressed in the EIS.

The DEIS includes a more site-specific assessment of soil and streambank types. However, the findings detailed in this section do not seem to have affected formulation of the alternatives or the selection of a preferred alternative. No alternatives are offered that avoid logging and roadbuilding in these sensitive areas, or that associated impacts are adequately mitigated. Though parts of several harvest units (including 9, 12, 18 and helicopter options H, K, and L) are in areas of high hazard soils, potential impacts are never addressed, none of the alternatives places planned clearcuts so as to avoid these erosion-prone areas, nor are mitigation measures to prevent slides in these areas discussed. Site-specific maps of soil hazard classes and their relationship to proposed harvest units, road construction, and helicopter units, as well as associated impacts, should be incorporated into the final EIS.

The map in Chapter 4 (p.19) shows that quite a few sensitive streambanks are located within or near proposed clearcutting and road building activities. The Forest Service's prediction that cutting in these areas is not expected to "cause measurable or long term changes in water quality" (ch.4, p.20) is doubtful at best, particularly given that the AHMU prescriptions proposed for these areas do not provide nearly the stream protection suggested by the National Marine Fisheries Service. The Tongass Land Management Plan assumes that all salmon projects on the Tongass will be built. If proposed fish passes were constructed on the lower falls in Frosty Creek, anadromous fish would be able to reach approximately 32 acres of new habitat. However, none of the harvest units along Frosty Creek and its tributaries would incorporate the 100-foot buffer strips which NMFS recommends for anadromous fish streams.

Discussion of economic impacts is extremely unclear. Among a host of discrepancies, Table 4-12 (ch.4, p.22) states that roadbuilding costs are higher in alternative 4 (which calls for less roadbuilding) than they are in alternative 2; it also states that total costs for alternative 4 would be greater than costs for alternative 2, though alternative 2 involves a much larger timber and roadbuilding program. These discrepancies must be resolved before other questions can be answered. Table 4-12 shows that costs for helicopter logging are lower (per MBF) than costs for the traditional logging proposed in the three alternatives. Why can't helicopter logging be used for the entire sale, or a greater portion of the sale area? These questions must be addressed.

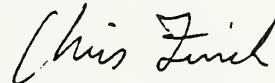
All of the proposed alternatives would take disproportionate amounts of timber from high volume stands.

The DEIS includes no site-specific information or maps on timber volume classes in the Frosty Bay area and, other than the highest volume class, does not include adequate information that shows the percentage of timber within each volume class that would be harvested under each alternative. However, the DEIS does list the overall percentages of timber that would be harvested from each volume class (ch.2, p.7). This information clearly shows that high-grading would continue under the preferred alternative. High-volume commercial forest land (class 6, 30-50,000 bf/acre) makes up only 9.4% of the total commercial forest land found in the Frosty Bay VCU, and only 5% of the total land base. However, depending upon the alternative selected, 17-20% of the total timber harvested would come from the high-volume class. Even more revealing, within the high-volume (30-50,000 bf/acre) class itself, 29-35% of the commercial timber, and 37-45% of the operable commercial timber in this class would be cut under the proposed alternatives. By contrast, in the preferred alternative, only 12% of the commercial timber and 19% of the operable commercial timber in the 8-20,000 bf/acre volume class would be cut, though this class accounts for 53% of the commercial forest land in the Frosty Bay VCU. This highly disproportionate cut of high-volume timber is unacceptable and does not constitute sustained yield management.

The significant difference in acreages calculated for volume classes in the Forest Plan and the Frosty Bay EIS (ch.4, p.21) is not sufficiently explained. Why is the discrepancy so large? What is the source of "the more recent and detailed inventory which was put into a computerized database"? What was the "difference in inventory methodology"?

In order for the Forest Service and the public to make responsible decisions on future plans for the Frosty Bay area, a full range of alternatives, detailed baseline data, and a comprehensive assessment of the impacts of each alternative must be incorporated in the EIS. Until the Forest Service does the job right, SEACC will oppose any timber sale at Frosty Bay.

Sincerely,

A handwritten signature in cursive script that reads "Chris Finch".

Chris Finch
Resource policy analyst





MAR 9 1990

REPLY TO
ATTN OF:

WD-136

Ronald R. Humphrey
Forest Supervisor
Stikine Area
Tongass National Forest
P.O. Box 309
Petersburg, Alaska 99833

Dear Mr. Humphrey:

In accordance with our responsibilities under the National Environmental Policy Act (NEPA) and § 309 of the Clean Air Act, we have reviewed the Draft Environmental Impact Statement (draft EIS) for the **Frosty Bay Timber Sale**. This draft EIS evaluates alternatives to provide a timber sale in the Frosty Creek drainage in the Wrangell Ranger District of the Stikine Area of the Tongass National Forest. The preferred alternative includes harvesting 22 million board feet of timber on 1,133 acres of land. About 574 acres would include helicopter logging.

Based on our review, we have rated the draft EIS EC-2 (Environmental Concerns - Insufficient Information). Our main concern is the effect of the action alternatives on water quality. We believe that the lack of a water quality monitoring plan may make it difficult to ensure that Alaska Water Quality Standards (WQS) will be met and beneficial uses are protected. Additional information on compliance with WQS, monitoring, and mitigation measures is needed. Our detailed comments are enclosed.

Thank you for the opportunity to review this draft EIS. Please contact Wayne Elson at (206) 442-1463 if you have any questions about our comments.

Sincerely,

Ronald A. Lee, Chief
Environmental Evaluation Branch

Enclosure

cc: Dave Sturdevent, ADEC
ADFG
NMFS

Stikine Area
MAR 13 '90

Info.	Forest Supv.
	P.O.
	A.O.
	Eng. Staff
	F&W Staff
	Planning Staff
	RL Staff
	S&W Staff
	Timber Dist.
	Publ. Dist.
	Wingl. Dist.

**U.S. Environmental Protection Agency Comments
Draft Environmental Impact Statement
Frosty Bay Timber Sale**

MONITORING

The need for monitoring is recognized in the draft EIS on page 4-24, but very little detail is given. Monitoring is particularly important for a project of this magnitude, because it provides a check on the predictions of effects for the action alternatives. It is important to evaluate the effectiveness of planned mitigation measures to protect potentially affected resources. We believe that an effective monitoring element should respond to the identified issues listed on pages 1-3 and 1-4. The identified issues include: sale profitability, visual quality, fish habitat, wildlife habitat, and the Frosty Bay anchorage. Water quality also needs to be considered in a monitoring plan.

The final EIS needs to include a feedback mechanism which relies upon monitoring so that standards and guidelines, best management practices, standard operation procedures, intensity of monitoring, and timber sale administration is adjusted when monitoring indicates a need. Providing such a process for adjustment will ensure that mitigation measures will improve in the future and that unforeseen effects are recognized and minimized.

The use of cards to record plans and changes for roads and harvest units condition during and after construction is an innovative approach to inventory and monitor conditions in these areas. Hopefully, the information from such cards will be summarized and reported to assess at some degree whether the planned mitigation activities have occurred (implementation reporting).

Additional monitoring activities should be considered. The risk of landslides has been mentioned and a generalized landslide risk map provided in the EIS, yet no monitoring of landslide occurrence after the sale is planned. The purpose of such monitoring would be to evaluate whether harvest unit and road location planning adequately avoided these high risk landslide areas. There is no mention of efforts to monitor large organic debris (LOD) in riparian areas which include harvest. Will retained LOD meet guidelines being considered in the TLMPII process? Critical fish habitat areas should be inventoried for fish habitat units (cover, feeding, spawning) and then monitored in years after the sale. There may be opportunities for thalweg profiling surveys in the same areas, to determine changes in pool depths and volumes.

WATER QUALITY/FISHERIES

Although the draft EIS discusses the water quality effects relative to length of sensitive streambank and total area of watershed, there is no discussion on compliance with Alaska Water Quality Standards (WQS). The draft EIS does not provide a basis to judge whether parameters such as temperature, turbidity, and

sediment accumulation will be kept at levels that protect beneficial uses and meet WQS.

SPECIFIC COMMENTS

- S-2 Mitigation measures are discussed as "suggested." Any needed mitigation measures need to be "required" and included as stipulation in any timber sale contracts.

- 2-6 What is the relationship of high value yellow cedar to helicopter units. Are the units primarily designed to capture these higher value stands?

- 4-10 "If these guidelines are followed, no measurable effect is anticipated and there will be no habitat-related reduction in the fish population." Implementation monitoring is how mitigation measures promised will match those implemented on the ground. Implementation monitoring needs to be discussed.

- 4-19 There is a limited attempt to analyze watershed sensitivity to landsliding. Where are the most sensitive areas? How do they relate to unit location boundaries, and frequency of entry. How do they relate to road, stream crossing, and rock quarry locations? It is very difficult to determine these relationships with the maps provided. Map 4-2 does not provide which alternative is described. The location of U-12, 10B, U-9, U-14A do not appear to avoid the sensitive streambanks on the map. Often the Class 3 streams on the steeper locations produce the most significant volumes of sediments.

The maps do not display topography and elevation in relation to roads and units. The reader cannot identify which units and roads have greater risk of impacts from landslides or erosion.

- 4-25 The analysis assumes that the helicopter option will be able to use existing roads, but the increased numbers of landings and sizes of landings is not discussed. Helicopter harvest requires larger landings to allow operation of the aircraft and decking of material yarded more rapidly to the landing area. This should require more land area and thus more rock and more rock pits. Helicopter yarding is done at 10 times the volume rate than high-lead.



28 March 1990

Mr. Ronald Humphrey
Forest Supervisor
Stikine Area
Box 309
Petersburg, Alaska 99833

NO	Forest Subv.	Act
	P.O.	
	Log Staff	
	FW Staff	
	Planning Staff	
	Int. Staff	
	S&W Staff	
	Timber Staff	
	Range Staff	
	Wildl. Staff	

Dear Mr. Humphrey,

I realize my comments on the Frosty Bay DEIS are too late to be officially included in the administrative record, but I hope you will consider them anyway on their merits.

Primarily my comments deal with the action's impact on goose habitat and nesting areas. The DEIS is less than completely forthright in exposing those impacts and is not specific in its description of proposed mitigation of those impacts.

Proper presentation of the environmental consequences of the proposed action would include maps overlaying proposed cutting units on identified Vancouver Canada Goose habitat. This should be done for at least the preferred alternative.

It is apparent from discussion on page 3-3 that very little, if any field investigation of the goose nesting areas has been done. How many geese are we talking about? When are the geese in the area. What is the actual density? Unless baseline data is collected before logging and road building, monitoring during the activity will tell you nothing. You cruise timber prior to developing alternatives, etc. Why don't you cruise other resources as well. Balanced, responsible multiple use management implies that you would know at least as much about one resource as you do another. How far from the streambanks do geese nest there?

On page 4-9, the size (width) of buffers proposed along streambanks is not specified. Without disclosing those widths in comparison to how far geese nest from streams you cannot adequately present the direct effects on geese or their significance as required in NEPA regulations 1502.16 (a). ~~That~~ ~~indirect effects~~ goes as well for indirect effects 1502.16 (b).

Also, on page 4-9, all proposed mitigation measures

should be specified, as per NEPA regulations 1502.16 (h).

On Table 4-1, page 4-4, the line "Relative Impact on Resident Deer Population", what is the threshold used to determine whether an impact is major, minor, or none? The determination looks pretty arbitrary to me. For instance the ^{difference in} ^{according to the data presented} impact on deer is greater between alternatives 3 and 4 than it is between alts. 2 and 3, yet the "Relative Impact" of alt. 3 is the same as alt. 4. Is analysis of impacts or public relations at work here? Without an explanation of criteria used, this line should be dropped.

Table 3-4; page 3-17, shows operable CFL in high volume stands ($> 30,000$ bd ft./acre) to be 11.4% of the total. According to table 4-1, page 4-3, all alternatives would harvest a greater pct. of this volume class than its occurrence. This is inappropriate. The scarcity of this volume ^{class of} timber (less than 12 ft. wide) makes it imperative that it not be harvested at a rate greater than its occurrence.

Also, table 4-1 and table 4-4 show different harvest rates for high volume old-growth. Which is correct?

Finally, I am sending you copies of two propaganda brochures produced by your agency. Obviously you haven't seen them yet. I wonder how the logging of one of the few "high-density Vancouver Canada goose nesting sites on the Tongass" fits in to the Taking Wing program. I imagine it would stand out like a black eye in the list of next year's "accomplishments" for the Alaska Region. Of course, it would never appear on such a list because the Forest Service doesn't like things like that to be widely known. The agency's concern for wildlife extends only to areas where logging would not be impaired.

I am forwarding a copy of the relevant portions of this DEIS to the Taking Wing committee and Ducks Unlimited.

Thanks for the opportunity to comment.

Sincerely,

Tom Paul

Box 20628

Juneau, Alaska

99802



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration

National Marine Fisheries Service

P.O. Box 21668

Juneau, Alaska 99902-1668

Wrangell
Ranger District

4 - 00

Info	Act
Dist. Ranger	
E.M.A.	
T.M. Oper	
O.R.A.	
F & W	
Planning	
Engineering	
Log. Acct.	
Resource Div	

March 30, 1990

Richard K. Kohrt, District Ranger
USDA Forest Service
Stikine Area, Tongass National Forest
P. O. Box 51
Wrangell, Alaska 99929

Dear Mr. Kohrt:

The National Marine Fisheries Service (NMFS) has reviewed Frosty Bay Draft Environmental Impact Statement (DEIS) in accordance with our responsibilities under the National Environmental Policy Act (NEPA) and the Fish and Wildlife Coordination Act. The document was not sent to us according to regular procedure, but was brought to our attention in a recent training course. Although we are submitting these comments after the official deadline, we expect that they will be given due consideration as required under NEPA.

As stated in our 1988 NMFS Alaska Region Policy for Riparian Habitat Protection in Alaska, we believe that a minimum of 30 meters (100 feet) no timber harvest buffer zones are necessary along both sides of all anadromous fish streams and their tributaries in order to insure the productivity and maintenance of fish habitat which supports commercial, recreational, and subsistence salmon fisheries in Alaska.

Measures to protect riparian habitat outlined in the fish section of Environmental Consequences remain deficient and inconsistent with NMFS policy. The Aquatic Habitat Management Unit (AHMU) prescriptions for Class 1 streams as defined in the DEIS allow up to twenty percent of the trees within that zone to be harvested (60 percent in Class 2, and 90 percent in Class 3). The NMFS objects to selection of an alternative which would allow any timber harvest within these 30 meter buffer zones.

This DEIS tiers from the Tongass Land Management Plan (Forest Plan) which discussed sustained yield timber harvest on the LUD IV areas associated with three timber harvest entries. Alternative 2 of the DEIS discusses two entries over a 50 year period and, Alternatives 3 and 4 discuss four entries over a 90 year period. The descriptions say subsequent entries "would remove the remaining economical volume..." While areas set aside for riparian habitat protection should not be available for future entries or considered as part of the remaining economical volume, the DEIS does not discuss any tracking to insure riparian areas are retained after future entry.



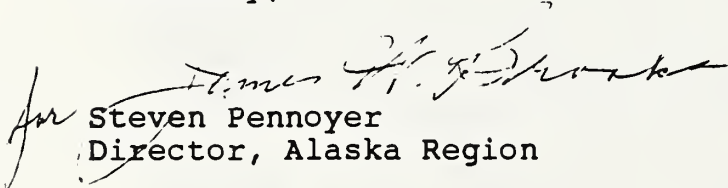
For this reason and the ambiguity about when or how many future entries there will be in the Frosty Bay Study Area, this DEIS should be considered applicable only to this sale (entry). Further, the FEIS should clarify its time frame, not hide future entry possibilities in the alternatives section as if a decision for that alternative would lead to a schedule for future entries. Such ambiguity makes the discussions of cumulative effects very superficial.

There is no discussion of the site chosen for log transfer in the Affected Environment section or impacts of construction and operation in the Environmental Consequences section. Although the decision to locate the LTF has already been made, the rational needs to be discussed in the DEIS to achieve the fullest disclosure of impacts. The document does not specify the method for transfer of logs to water. The NMFS has recommended (April 8, 1985, letter to COE) low velocity transfer of logs to marine waters and that log storage shall be in water of no less than 40 feet of depth at mean low low water to prevent grounding on fragile substrates.

There is no language in the Department of Army Section 404 or the Environmental Protection Agency National Pollution Discharge Elimination permits requiring the LTF be removed or when. It has been our observation that fill in the tidelands is rarely removed. In general, once valuable equipment is removed, the LTF site (fill) is abandoned unless/until modified for subsequent use. We encourage complete removal of these fills to restore habitat to full productivity.

Page specific comments are enclosed. We appreciate this opportunity to comment.

Sincerely,


for Steven Pennoyer
Director, Alaska Region

National Marine Fisheries Service
Frosty Bay DEIS March 30, 1990

Specific comments:

Chapter 1, page 2, Para 8: The permit authorizing use of tidelands for the LTF should be specified and a copy included with the material in Appendix B.

Chapter 1, page 3. Fish Habitat issues include: number of stream crossings, length of road within AHMU areas, potential for sedimentation in spawning beds, channel stability at the middle of Frosty Creek, potential for large woody debris depletion, temperature sensitive segments of the stream, and timber harvest within AHMU areas.

Chapter 1, page 4, Para 3: Add that the waterway name and number and of the Department of Army Section 404 permit is Ernest Sound 18, 071-OYD-2-850099. We note the Environmental Protection Agency NPDES authorization for the LTF expires June 1991.

Chapter 2, page 1: The document should state the reason why there is no need to re-analyze the LTF location decision. We do not understand why this statement is included under the heading "Stikine Area Guidelines Followed".

Chapter 2, page 3 item (d): What period of time is meant in the statement saying the LTF and bridges "will be temporary structures"? We question how "temporary" the LTF and bridges are intended to be when timing for future entries to remove the remaining economical volume is unknown.

Chapter 2, page 4: In the title for alternative #3, the adjectives "Larger" and "Smaller" need to be switched.

Chapter 2, page 8: More information on the plan to construct fish passage facilities is needed. If listed as "mitigation", some plan specifics and projected cost-benefits should be provided. Does ADFG recommend construction? How does this effort fit into FS/ADFG priorities for fish passage construction in the Stikine area? As discussed in Chapter 3, page 3, the number of falls to be ladderred (2-3) should be discussed here in greater detail and in the preferred alternative (mitigation measures) section.

Chapter 2, page 8 item (c): See statement above, what period of time is meant when it says LTF and bridges will be temporary structures and will be removed following sale activities? Will the fill in the tidelands be removed?

National Marine Fisheries Service
Frosty Bay DEIS March 30, 1990

Chapter 2, page 9 item 3: The proposal for construction of "fords" crossings over Frosty Creek raises concern over the potential for blocking fish passage, destruction of instream habitat, and water quality degradation from sedimentation. Adverse effects from this type of activity may last many years and may limit the advantage of providing access to habitat above the barrier falls.

Chapter 2, pages 10-13: The maps with cutting units identified could be improved. The print to identify units is so small that it is difficult to read. The location of the proposed LTF should be marked. Is there an additional "landing area" needed for the helicopter option to work? Where would the logs be laid down or dropped in the water?

Chapter 3, page 1 or 3: There should be mention of humpback whales as frequenting the marine waters adjacent to the study area. Humpback whales are on the endangered species list and, therefore, warrant separate mention.

Chapter 3, page 3: The "Fish" section needs a heading. There needs to be a citation associated with the statements about spawning escapement estimates. Both present and potential fish resources should be discussed in more detail. There needs to be a map showing the stream classes (I, II, or III) and who determined the classes. Without that information we can't work through the summary tables such as Table 4-1 and 4-5 to verify presence or absence of buffer zones.

Chapter 3, page 5, Para 1: The projections of an estimated 3000 coho/steelhead should be accompanied by some reference as to how this estimate was computed.

Chapter 3, page 5, Para 3: The last sentence should read "However, fish kills related to water temperature have not.."

Chapter 3, page 14: The map should show the study area boundary.

Chapter 4, page 5, Table 4-1: By comparing number of road crossings of Class I streams with the number given for miles of road build within Class I AHMU's it appears the road is partly located within the buffer zones not just crossing it. Where is that happening (which units) and why?

Chapter 4 page 10: There needs to be a heading for "Fish".

Chapter 4 page 11: The statement is made: "If these guidelines are followed, no measurable effect is anticipated and there will

National Marine Fisheries Service
Frosty Bay DEIS March 30, 1990

be no habitat-related reduction in the fish population." What is being done to back the statement up? Monitoring? What management action is taken if the trees within the AHMU blow down? We recommend they be left in place however they fall unless a definite block to fish migration is documented.

List of Agencies, Organizations and Persons, page 1: The USDC National Marine Fisheries Service is not included on the list. This is surprising because NMFS has been included in past DEIS mailings such as the Woewodski Island DEIS in 1987. NEPA and the Fish and Wildlife Coordination Act require consultation with our agency.

Follow up discussion on the issue of anchorage in Frosty Bay needs to be better organized and clear. This issue is important and apparently a primary reason why Alternative 2 was not selected. Follow up on the anchorage issue should have its own heading in the Environmental Consequences section and Table 4-1 as do habitat, visual, and economic issues. Discussion is currently buried in several sections of the document (Pages 21, 22, 38, 65, and 69).

Appendix I

Wildlife Habitat Retention in the Preferred Alternative in the Draft Forest Plan Revision

WILDLIFE HABITAT RETENTION

The preferred alternative in the Draft Forest Plan Revision published in June, 1990 has standards and guidelines for old growth management that vary considerably from current management direction. The following are the differences:

Current Direction

Retention Categories with varying percentages applied only to operable CFL

Allocated by VCU
(Value Comparison Units)

No size or dimension specifications on retained patches

Draft Revision Direction

Flat 24% applied to all CFL

Allocated by WAA
(Wildlife Analysis Areas)

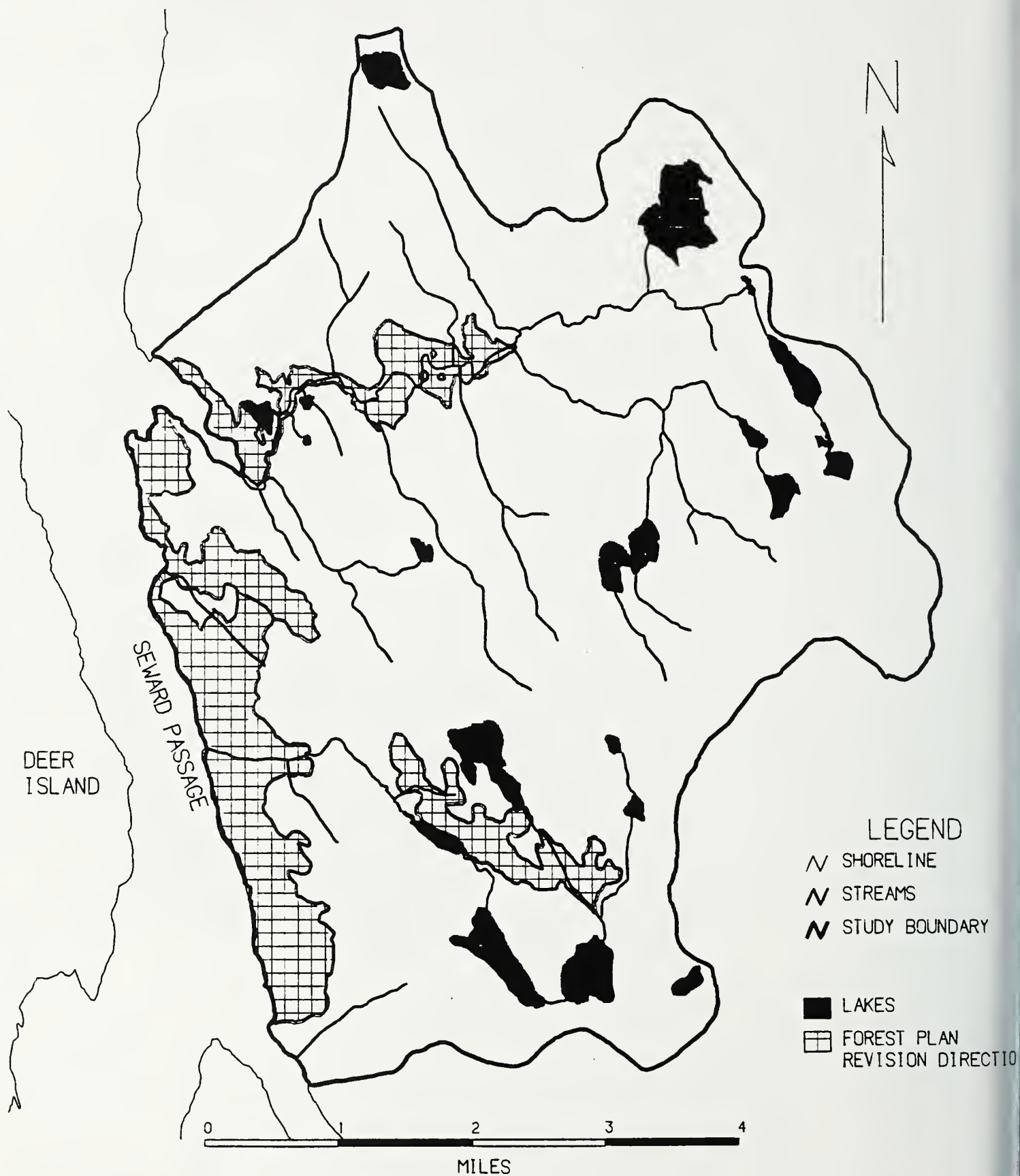
3/4 of old growth areas in blocks of 1000 acres or more

At least one 5000 acre block per Wildlife Analysis Area

Minimum width generally greater than 1/4 mile

A brief analysis was conducted to determine if the proposed new direction could be implemented in the Frosty study area following harvest of any of the action alternatives. The study area is part of Wildlife Analysis Area (WAA) 1816 which includes the area to the south around Sunny bay and Santa Anna Inlet. For simplicity, the 24% was only applied to the study area, yielding a total of 2300 acres to be managed for old growth, or 1110 acres more than under current direction. Using the current retention map (Map 4-2) as a base, the additional acres were plotted and are shown on the following page. Even if Alternative 2 were implemented, it would be possible to allocate 2300 acres to old growth management, although some of the areas wouldn't be as valuable as some of the currently allocated areas. The other guidelines of 1000 acre blocks and 1/4 mile width can also be implemented. The 5000 acre block would have to include the rest of the WAA and could be connected to the large block in the west and southwest parts of the study area.

Map of Wildlife Habitat Retention According to the Preferred Alternative of the Forest Plan Revision



MAPSCALE 1:63360

Appendix J

Potential Sale Area Improvement Projects

Potential Sale Area Improvement Projects

The following projects are proposed for inclusion into the Sale Area Improvement Plan which will be prepared for the Frosty Timber Sale. The type of funding (where the money comes from) will be dependent upon the project and the amount of revenue generated from the timber sale.

Regeneration surveys:

All harvest units will be field checked for the adequacy of natural regeneration. Total acres of 1273 acres will be treated. These will be funded out of timber sale proceeds.

Planting:

If natural regeneration is not adequate, planting will be done. It is not anticipated that the amount of acreage requiring planting will be more than 10 per cent of the total harvest acres. Plan for 125 acres for planting. If planting is done, the planting surveys will also have to be conducted on the acres planted. Planting costs will be funded out of timber sale proceeds.

Precommercial Thinning:

This will be done only if deemed necessary. It is normally done for wildlife habitat improvement or timber productivity. It is estimated that approximately 600 acres will be treated with precommercial thinning. Since this activity normally occurs between year 10-15 after harvest, for timber productivity, funding will have to be from appropriated funds. If done for wildlife habitat before year 10, then it can be funded from timber sale proceeds.

Goose Impact Study:

First year of study is now being conducted to determine present population and habitat areas. This is being funded out of appropriated dollars. If the sale is sold, subsequent funding will come from timber sale proceeds.

Cabin Development:

After sale administrative activities are completed, the administrative cabin will be moved to a location more suited for recreation use. Cost of move and development will be funded out of timber sale proceeds. It may be possible to also construct a float for recreational use in front of the cabin. Cost of this development may be from either timber sale proceeds or project funds.

Fishery Enhancement:

Analysis of the feasibility and desirability of constructing a fish ladder over at least the first barrier falls on Frosty Creek will be done. Cost of this analysis will be borne by timber sale proceeds. Depending on the cost and scope of the ladder, the construction cost may come from timber sale proceeds or from appropriated funds. Sport fishery analysis and enhancement will also be done. Those areas to be improved within the sale area can be funded out of timber sale proceeds.

Trail Construction:

Studies to determine the desirable trail locations and sites will be conducted after timber sale activities are completed. Trail construction within the sale area may be financed out of timber sale proceeds. A portion of the portable bridge will be left on the major creek crossing on Road 6850 to provide trail access. If this bridge is improved (railing installed), then financing can be from timber sale receipts.

Buffer Strip Monitoring:

A study to determine the effectiveness of the buffers designed on the Frosty Timber sale may be conducted. Since this is the first independent timber sale to fully integrate this concept in the layout of the units, the effectiveness and the applicability of the designs used should be determined. This can be funded out of timber sale proceeds.

**Visual Design
Monitoring:**

The timber sale will cause a change in the landscape character of this area. A study to determine whether the appropriate mitigation measures have been instituted maybe done. Before and after photo sequence will be used as the basis of this study. The appropriateness of the measures instituted will be determined. The effect of natural events (i.e. blowdown) will also be shown. An attempt will be made to determine if landscape design principles can reduce the occurrence of these events. This can be funded out of timber sale proceeds.

**Mitigation for
Geese**

If the results of the goose impact study indicate that the amount and success of goose nesting has been reduced by the timber sale, mitigation measures will be taken. These may include, but is not limited to, the construction of goose nesting platforms, planting of preferred goose browse, or other measures.

